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SECOND QUARTER 2003

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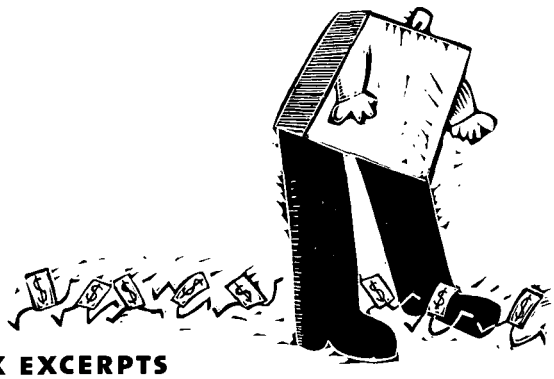

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FROM THE PRESIDENT

I am writing these words just hours after the conclusion of the sixth annual Milken Institute Global Conference, so my thoughts are naturally focused on what turned out to be a remarkable event. This was my second Global Conference as head of the Institute, and I'm still amazed at not only what goes into putting on the event, but also what comes out of it.

This was our biggest conference yet, with some 180 panelists and more than 1,600 in attendance. Our purpose in organizing the Global Conference is to bring together a distinguished and diverse audience of decision-makers from around the world to debate current events and – we hope – generate ideas for speeding economic growth. This year, with the world grappling with both the war in Iraq and a stagnant global economy, we focused on diverse subjects ranging from geopolitical security to ways to meet looming pension liabilities in rapidly aging societies. And we seasoned the brew with sessions on everything from the protection of intellectual property to the changing role of big-city mayors.

Here are just a few facts, opinions and ideas that caught my ear:

- Biotech investments, which totaled $37.2 billion in 2000, are expected to be a mere $6.8 billion in 2003. Yet, experts are generally optimistic that a turnaround is just over the horizon.
- Obesity has risen to epidemic proportions in America; the plague affects some 60 percent of adults and 13 percent of children.
- China's western regions are poised to become an Asian version of the American Midwest within 35 years.
- Carbon dioxide in the earth's atmosphere increased by 18 percent in a little more than four decades – a spike of a magnitude never before recorded.
- Our experts projected that, within a decade, spending on health care will equal 17.2 percent of GDP, up from the current level of 14.3 percent.
- Russia was the second-best performing stock market last year, after Pakistan.
- Eighty percent of information throughout the globe is now stored in a digital form, but 10 percent of the potential revenue from licensing its use is pirated each year.
- Half of the new teachers in the Los Angeles school district were hired with emergency credentials.
- Seventy percent of the nation's capital stock is in human form – in skills gained from schooling and on-the-job training.

If you were unable to join us this year for the Global Conference, I invite you to check out the session summaries on our Web site – www.milkeninstitute.org. And I hope you can join us next year.

Michael L. Klowden
President and CEO

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Beverly F. of Valdosta, Ga. dropped us a line to say that the *Milken Institute Review* has proved a dandy source of material for collages in her 3rd grade art class, while Frank R. of Athens, Ohio has found that the cover makes a colorful liner for the cage of his guinea pig, Dubya. If you have a suggestion for recycling the *Review*, do let us know. Meanwhile, for your reading pleasure:

Greg Rushford, the publisher of *The Rushford Report* newsletter on trade and development, takes a whack at the U.S. International Trade Commission – a federal regulatory agency that has largely been captured by domestic commercial interests.

"The extraordinary lengths to which the ITC has gone to dodge its legal obligations might provide comic relief to those who appreciate the more outrageous workings of politically compliant bureaucracies," he writes. "Unfortunately, in the process of pleasing the Stand Up for Steel lobby, the ITC has created a serious rule-of-law problem. There should be little humor in that – at least for anyone who cares about America's credibility with its economic allies."

Nick Eberstadt, a demographer at the American Enterprise Institute, speculates about the likely impact of AIDS on the Chinese economic miracle. And his crystal ball offers some disturbing sights.

"China's impressive record to date in improving public health does not guarantee that an emerging epidemic will be handled with equal efficacy," he writes. Indeed, China's initial unwillingness to cooperate in detecting and isolating cases of Serious Acute Respiratory Syndrome (SARS) drives home the point

David Evans of National Economic Research Associates and **Peter Passell** of the Milken Institute (yup: me) introduce the concept of the "two-sided" market, where sellers must convince two sorts of users to buy the product in order to make it valuable to either. Think matchmaking, or real estate brokerage.

"The complexity of operating in two-sided markets creates challenges for investors and managers, who face unfamiliar problems in identifying winning strategies," they note. "More important from the perspective of public policy, it challenges regulators to

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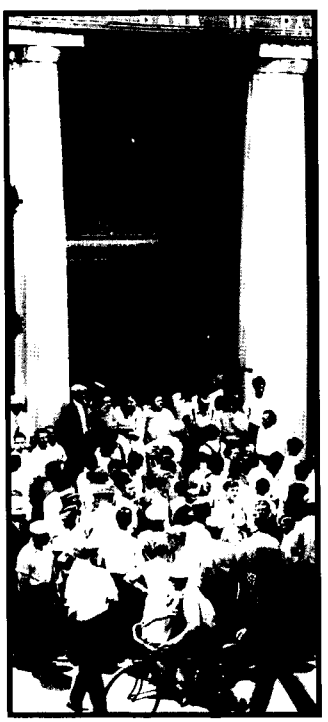
rethink the way they judge the health of competition."

Rick Mishkin of the Columbia University Business School and Eugene White of Rutgers ask whether the Federal Reserve could (and should) have intervened to nip irrational exuberance in the bud before the stock market crash of 2000. Well, actually, they do more, using evidence from a century of market meltdowns to develop a rule of thumb for where and when Fed intervention makes sense.

"The problem facing monetary policymakers," they write, "is not stock market bubbles, but financial instability – which may or may accompany market crashes. By focusing on financial stability rather than stock prices, central banks are both more likely to manage their core task well and to maintain political support for their independence."



Steven Nyce and **Syl Schieber** of Watson Wyatt, the pension consultants, lay out the likely consequences of the explosion of oldsters and the implosion of youngsters in coming decades. The burden will be greatest in Japan and Europe, but no picnic in the USA.

"In the long term, developed economies will not be able to improve living standards if productivity gains don't outstrip declines in the number of workers," they write. "The increasing rates of labor force participation among people between the ages of 20 and 60, and falling fertility rates mask this problem for a while. But as this scenario plays out, there simply will not be enough workers to bear the burden of an ever-growing elderly population."

Robert Haveman and **Barbara Wolfe** of the University of Wisconsin add a new wrinkle to the debate over the value of investments in education. In the 3rd quarter 2002 issue of the *Review*, Alison Wolf questioned the received wisdom that you can never have too much of a good thing, and David Card tartly responded. Now Haveman and Wolfe are taking their turn, arguing that education generates benefits far in excess of those that can be measured in earnings gains.

"It is not unreasonable to suggest that the gains from all of the categories of private non-marketed and external or public goods are at least equal to the annual earnings effect of more schooling estimated in the traditional studies," they say. "If so, the full social rate of return to an additional year of schooling would be on the order of 14-18 percent, or double the return to education discussed by Wolf and Card."

As usual, our cup runneth over. This issue also includes *two* book excerpts (one by **Stan Liebowitz** of the University of Texas, the other by **Rich Miniter**, a former editor of the *Wall Street Journal*'s European edition), an interview with Yale's **Robert Shiller**, a chartiicle by the Milken Institute's **Bill Frey**, and reflections on globalism by the Institute's **Michael Intriligator**.

And, hey – don't forget to recycle

— Peter Passell

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BY WILLIAM H. FREY

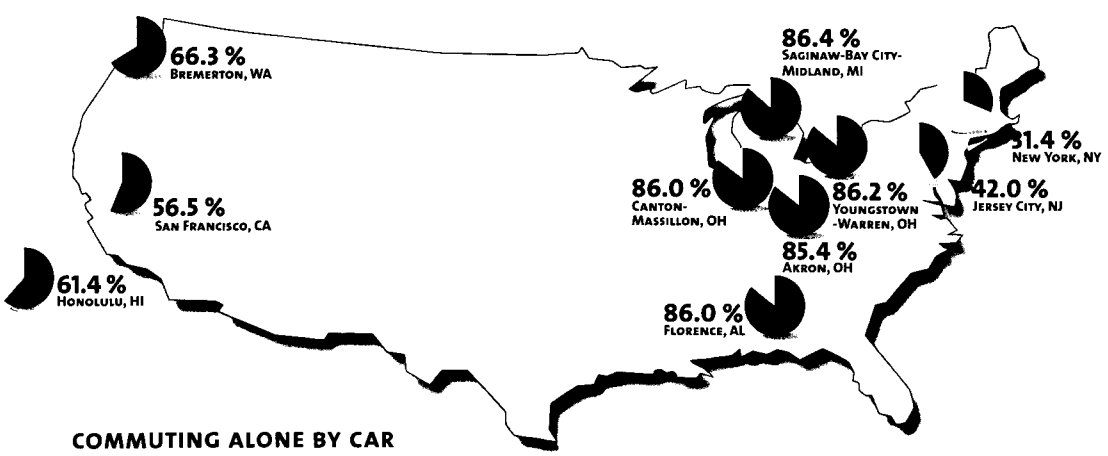
The image of the long-commuting, gas-guzzling American is supported by newly released Census 2000 statistics, which show that three out of four workers drive to work alone and spend an average of 25.5 minutes en route.

Many communities have increased their average commuting times over the 1990s – apparently the consequence of urban sprawl. Consider Merced, California, where workers increased their commute from 17 to 26 minutes over the decade. Commuters in Atlanta, America's capital of sprawl, spend more than a half-hour in transit – within striking distance of gridlock centers like New York, Chicago and Washington.

Fewer than one in eight workers carpool. It will surprise many to learn that California metro areas stack near the top of the list in carpool participation. Even Los Angeles, freeway central, ranks above most other big cities. Hardly anybody – 3 percent and declining – walks to work. But there are exceptions including State College, Pennsylvania, and, of course, New York City.

Telecommuting hardly registers on the radar. The few exceptions include Santa Fe, Boulder, Ashland (Oregon) and Santa Cruz. And even in these places it's likely that many homebodies actually work at the local Starbucks, where they can find a broadband Internet connection.

Census 2000 didn't ask whether respondents fly to work, but estimates can be gleaned from reports by those who work far from home. Los Angeles, New York, Chicago,



BRUCE SANDERS (ALL)

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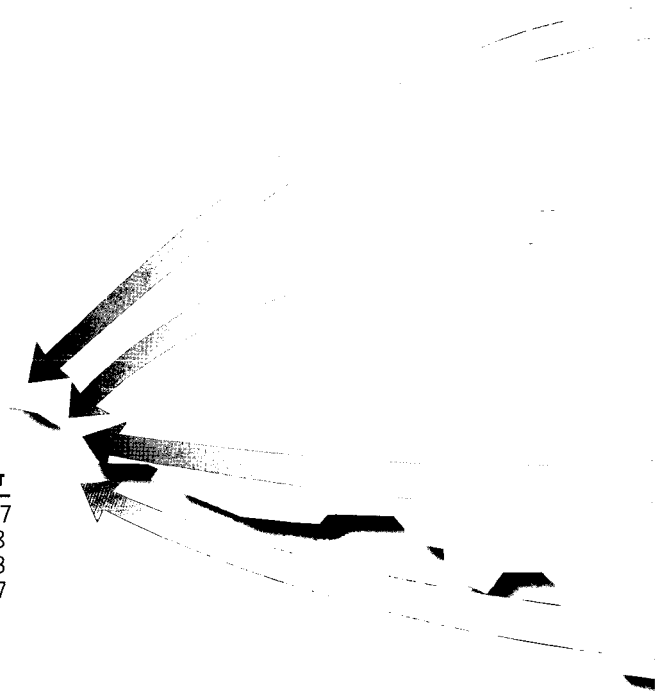

LOS ANGELES COMMUTERS WITH:	IN	OUT
New York	537	1027
Miami	50	168
Chicago	192	423
Washington DC	115	227

HIGHEST PERCENTAGE WALKING TO WORK

AVERAGE = 2.9%

	PERCENT
State College, PA	12.4
Jacksonville, NC	10.4
Iowa City, IA	10.0
New York, NY	9.3
Bloomington, IN	8.6

San Francisco and Washington lead the jet-set. For example, 1,027 LA County residents say they work in Manhattan, while 537 Manhattanites work in LA. Will the day come when telecommuting replaces long-distance commuting? Not likely, as long as face-to-face contact is essential – and of course, as long as the winter sun shines in Laguna Beach and trophy houses are for sale in the Hollywood Hills. M

BILL FREY is a senior fellow in demography at the Milken Institute and a visiting fellow at the Brookings Institution in Washington, DC.

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CHICAGO

COMMUTERS WITH:	IN	OUT
New York	256	328
Los Angeles	423	192
Miami	152	78
Washington DC	58	139

MANHATTAN

COMMUTERS WITH:	IN	OUT
Los Angeles	1027	537
Miami	364	168
Chicago	328	256
Washington DC	283	358

WASHINGTON DC

COMMUTERS WITH:	IN	OUT
New York	158	143
Los Angeles	227	115
Chicago	139	58
Miami	98	0

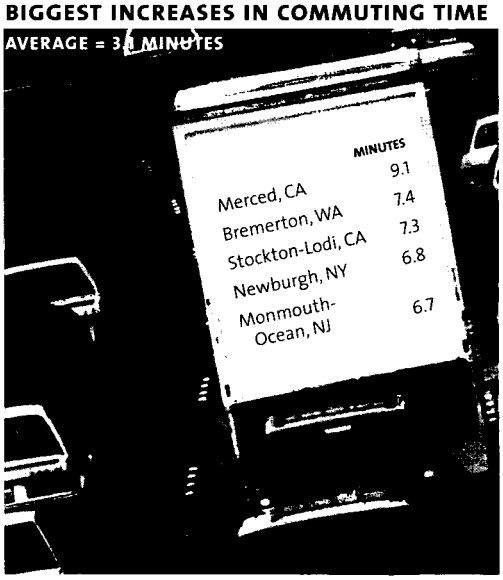
MIAMI

COMMUTERS WITH:	IN	OUT
New York	168	364
Los Angeles	168	50
Chicago	78	152
Washington DC	0	98

AVERAGE = 3.3%

	PERCENT
Santa Fe, NM	6.9
Boulder-Longmont, CO	6.4
Medford-Ashland, OR	5.6
San Luis Obispo CA	5.6
St. Cloud, MN	5.5

BIGGEST INCREASES IN COMMUTING TIME



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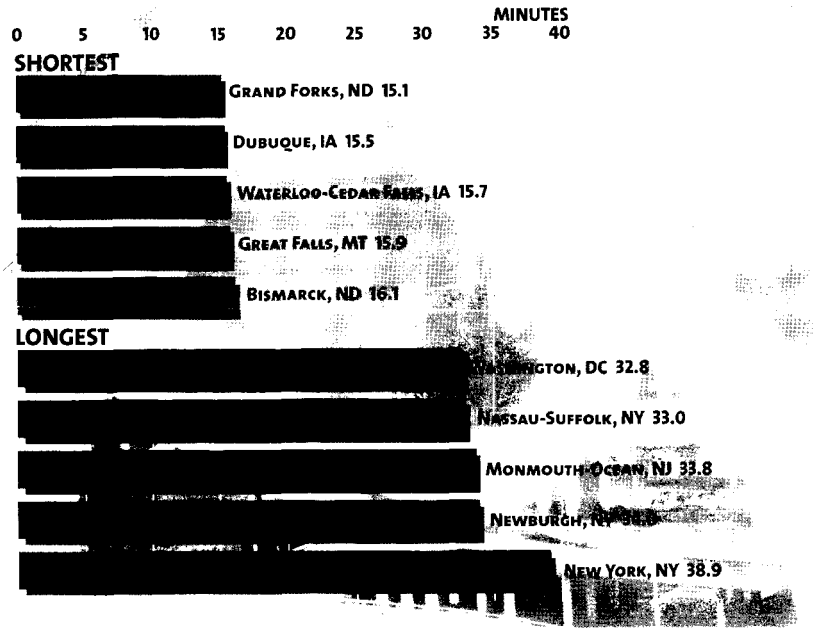
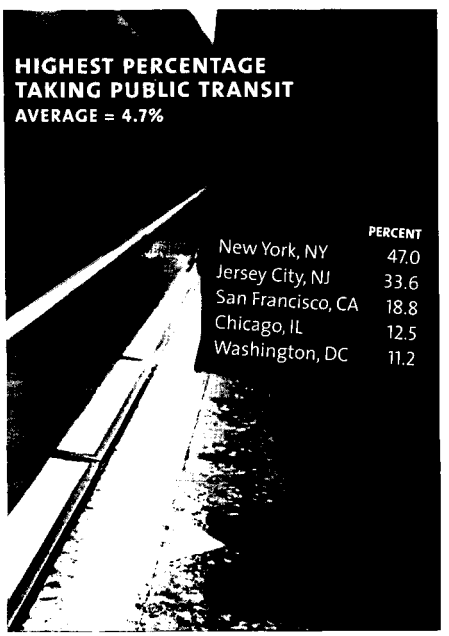
LONGEST AND SHORTEST COMMUTES





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BY GREG RUSHFORD

Ah, Washington, the town where politics trumps all. Law? Certainly. Economics? Busywork for bean counters. Even common sense, when it gets in the way of the folks who instruct the folks who interpret the rules. Consider the United States International Trade Commission, a small quasi-judicial federal agency charged with administering key portions of America's trade laws.

The six commissioners – presidential appointees subject to Senate confirmation – are nominally independent. But Washington being Washington, such independence does not extend to the domestic steel lobby and other special pleaders. In a series of politically charged trade cases, the ITC has failed to do the solid economic analysis that would meet America's legal obligations as a member of the World Trade Organization. And when WTO dispute-resolution panels have slapped down the ITC's shoddy work, the commission has ignored them.

Nor, for that matter, have commissioners paid much attention to instructions from U.S. judges. The extraordinary lengths to which the ITC has gone in some cases to dodge its obligations might provide comic relief to those who appreciate the more outrageous workings of politically compliant bureaucracies. Unfortunately, in the process of pleasing the Stand Up for Steel lobbying group, the ITC has created a serious rule-of-law problem. There should be little humor in that – at least not for anyone who cares about America's credibility with its economic allies.

GREG RUSHFORD publishes *The Rushford Report*, a monthly newsletter on international trade and development policy.

WHAT'S GOING ON HERE?

When companies or whole domestic industries file antidumping cases that accuse foreign producers of offering American consumers too good a deal, the U.S. Department of Commerce first must determine whether the petitioner has been the victim of unfair foreign competition. This is roughly defined as foreigners selling goods below cost. The Commerce bureaucracy – which is even more inclined to see it the American producers' way than the ITC – is almost always shocked to find that dumping is going on. Like the police inspector in *Casablanca*, who was shocked to discover gambling in Rick's Cafe.

Once Commerce charges the nefarious foreigners with unfair trade practices, the case goes to the ITC. Before the dumpers can be taxed, the ITC must determine that dumping – not other factors – injured the petitioner. If it has not, the case must be circular-filed.

Now, from economists' perspective, the very notion of dumping is far-fetched. Within our own borders, American businesses routinely do the equivalent – selling below fully

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allocated costs in distressed markets if they can cover the incremental cost of production. Such behavior is a healthy response to hard times: it is better, after all, to sell at deep discounts than to idle plants and lay off workers. But when foreigners engage in similar practices – when they offer their widgets in U.S. markets at cheap prices for the same reason – economists don't have the last word.

The ITC is also charged with investigating alleged injury in cases involving the federal safeguards statute. That statute, Section 201 of the Trade Act of 1974, is not concerned with whether foreign competition is unfair, however the term is defined. Under it, domestic industries can seek relief from foreign competition simply because they have been hit hard by a surge in imports and could use a breather – perhaps years of temporary quotas and tariffs – to get back to profitability. In these Section 201 cases, the ITC is supposed to determine the extent to which the import surge has really caused injury.

This sounds straightforward – and might be, were it not for the pressures buffeting its deliberations. When ITC votes against Big Steel – sometimes it does happen – threats of retribution follow as surely as general elections follow primaries. Everyone in Washington's trade bar knows the drill: threats from The Hill to cut the budget for the ITC's Economics Office, even personal attacks on commissioners. Two years ago, President Bush bowed to the domestic steel lobby and refused to renominate ITC Commissioner Thelma Askey. Askey's problem: she lacked the stomach to ignore the facts. Over the years, commissioners have learned that honesty and political survival don't mix.

SLAPPED DOWN AT THE WTO

Since 1995, World Trade Organization dispute panels have considered four challenges to ITC Section 201 safeguard decisions. The four: pipe from Korea, lamb from New Zealand and Australia, and wheat gluten and steel wire rod from the European Union. Each case raised different issues. But in each, the WTO panels decided that the ITC did not perform sufficiently rigorous injury analysis to comply with Article 4 of the WTO's own rules, which gives countries some leeway to buffer industries from import surges.

Moreover, in proceedings involving challenges to United States antidumping actions, the WTO's appellate body has found that the methodology the ITC has been using to find injury does not stand up to scrutiny. Thus, when Japan challenged a U.S. antidumping action targeting hot-rolled steel, the ITC barely went through the motions before giving the Japanese a cold shoulder.

Although the legal issues are not understood well by Congress, you don't have to be a $500-an-hour trade lawyer to see what's happening. In both safeguards and antidumping cases, the ITC must find a causal link between injury to the domestic industry and the imports, or dismiss the case.

By the same token, Article 3.5 of the WTO's antidumping code specifies that when a national authority like the ITC examines injury claims, it must consider other factors contributing to the injury – for example, the "volume and prices of imports not sold at dumping prices." Most people are not puzzled by the language: if the fairly traded imports rather than the dumped imports are driving down prices, the injury to the domestic petitioner can hardly be blamed on dumping.

Article 4 of the WTO safeguards agreement follows the same reasoning. It obligates the ITC to "evaluate all relevant factors," like the "rate and amount of the increase in imports" before finding a "causal link" be-

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tween increased imports and the serious injury. One line in Article 4(b) says it all: "when factors other than increased imports are causing injury to the domestic industry at the same time, such injury shall not be attributed to increased imports."

All the WTO jurists ask is that the ITC undertake an economic analysis capable of passing a laugh test, and then document the reasoning. No big deal, you say? You're not an ITC commissioner. In recent decades, the commission has gotten used to finding injury without rigorous economic analysis. With advice from Congress, the commissioners have decided that dumping only has to be somewhere in the mix of contributing factors. The commission has even argued that the dumping does not have to be a significant factor in the injury.

Last year, in the case brought by South Korea against United States' safeguards on pipe, the WTO's appellate body criticized the ITC for its shoddy analysis of other economic factors contributing to the injury, like the sharp declines in demand for pipe by the oil and natural gas industries. By the same token, when Japan appealed the ITC's aforementioned antidumping decision on hot-rolled steel, the legal literalists at the WTO wondered why the ITC did not consider the impact of increased production capacity at domestic steel minimills or the adverse effects of a strike at General Motors.

SLAPPED DOWN BY U.S. LAW

The ITC has had its problems with domestic courts, too. In December 1997, the U.S. Court of Appeals in Washington ruled on an antidumping case involving magnesium imports from Russia, Ukraine and China. The decision in *Gerald Metals v. United States* tracks the same reasoning as the WTO's Article 4 safeguards agreement and Article 3.5 of the antidumping code. Basically, the court said that if the domestic magnesium producer – Utah-based Magnesium Corporation of America – was being injured by fair competition in the global market, and not by dumping, the ITC's injury analysis must reflect that.

While ordinary people would immediately grasp the court's logic, the ITC bureaucracy was in no mood to be confused by reason.

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First, the ITC's general counsel, Lyn Schlitt, along with the seven Washington law firms that represent Stand Up for Steel tried unsuccessfully to have the opinion reversed. Since then, *Gerald Metals* has become the legal elephant in the hearing room – the ITC's lawyers and commissioners simply pretend not to know it is there. As best as I can determine, in the five years since the decision, the ITC has acknowledged that *Gerald Metals* was the law of the land in just one case.

BUREAUCRATIC IMPERATIVES

It is fascinating to see just how far the commissioners have been willing to go to please the politically connected. Consider the petitioner in the string of continuing magnesium cases that began in 1992 and resulted in the *Gerald Metals* ruling.

The Magnesium Corporation of America has for many years been in deep doo-doo with the Environmental Protection Agency – seems the EPA does not appreciate the company's inclination to release chlorine into the air.

MagCorp is a subsidiary of Renco Metals, which is owned by Ira Rennert, a man whose lifestyle would have made Louis XIV jealous. He owns a house on 63 acres fronting the beach in the Hamptons, with two bowling alleys, two libraries, an art gallery, and servants' quarters for a dozen. *Time* has dubbed Rennert "the man with 41 bathrooms," although *The New York Times* reported only 39.

More relevant here, Rennert writes big checks to both parties. Recent recipients of Rennert's generosity range from the National Republican Senatorial Committee to Joseph Lieberman. And cynics may wonder whether his open checkbook has something to do with the ITC's propensity to give Rennert the benefit of the doubt.

In July 2000, the ITC refused to revoke a 1992 order involving government subsidies given to Norsk Hydro, a Quebec magnesium producer. The offending subsidy was a one-time grant from the government of Quebec that underwrote Norsk Hydro's installation of pollution-control equipment. The ITC said that lifting the order would likely lead to a recurrence of injury to the Magnesium Corporation of America "within a reasonably foreseeable time." Or to put it another way, in the American political system domestic polluters trump green foreigners.

The ITC proved to be even more concerned about Magnola Metallurgy, another magnesium producer in Quebec. Magnola was just starting up in 2000, having spent some $700 million to position itself to sell magnesium in U.S. markets. But Magnola had never produced any ingots. Prices in the U.S. magnesium market were effectively set by third-country exporters like Russia and China, not by dumped Canadian metal.

But even though Magnola had never been found to have dumped anything, the ITC voted to hit it with a preemptive 21 percent antidumping tariff, along with countervailing duties of about 7 percent.

In July 2002, a U.S.-Canadian panel convened to resolve disputes under the North American Free Trade Agreement sent the case back to the ITC with instructions to take another look – this time applying the *Gerald Metals* precedent properly. In October, the ITC flat-out refused, issuing a 22-page ruling signed by all five current commissioners that dripped with bureaucratic scorn.

We're right, you're wrong, the commissioners told Nafta, "We incorporate in full our prior findings, analysis and conclusions." Quebec has gone back to the Nafta panel, asking that it order the ITC to terminate the case in accordance with U.S. law.

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STANDING UP FOR THE STEEL LOBBY

Need more convincing of the ITC's intransigence? Consider the decision in *Nippon Steel v. United States*. Here, Weirton Steel alleged that it was being injured by dumped imports of tin- and chromium-coated steel from Japan. The ITC sided with Weirton. But a federal judge subsequently tied a legal tin can to Weirton's case, documenting a certain desperation in the ITC's enthusiasm for the arguments offered by lawyers for the politically connected domestic mill. In December 2001, Judge Jane Restani of the U.S. Court of International Trade sent the proceedings back to the ITC. Citing *Gerald Metals*, Restani instructed the commission to take another crack at analyzing other possible factors that may have "made a material contribution to [Weirton's] injury."

The ITC refused to reconsider, so lawyers for the Japanese manufacturer went back to court. And in August 2002, Judge Restani issued a blistering opinion that ordered the ITC to terminate the case. The judge decided that "uncontested evidence leads inexorably to the conclusion that lower-priced subject imports did not have a material effect on domestic prices." She found that for two of the three years the ITC had examined, the Japanese had generally sold their steel in the U.S. market at a higher price than Weirton did. Moreover, imports from third countries had enjoyed a greater market share in the United States.

Judge Restani also found that Weirton sold mainly in the eastern United States, while the Japanese steel sold in the west. "The only pricing documents submitted by Weirton apparently showed that its pricing range was determined without regard to foreign prices," Restani observed. Furthermore, Weirton's customers cited quality and service problems with the long-troubled mill. As Restani put it, the evidence "showed domestic producers' on-time performance was poor" during the period involved. "The Commission's apparent tunnel vision is misleading and violates the court's directive to analyze and present data in a manner that facilitates review," Restani concluded.

For those attuned to black humor, it is fascinating to see just how far the commissioners have been willing to go to please the politically connected.

As this article goes to press, the ITC has come under more fire from the WTO for its approach to an even more important steel issue. When commissioners gave the go-ahead for the Section 201 safeguards plan that led President Bush to slap tariffs as high as 30 percent on foreign steel, they once again failed to perform a proper injury analysis. The commissioners found injury to the petitioning domestic mills even though most categories of steel imports were actually falling. Remember, Article 4 of the WTO's safeguards agreement requires evidence of rising imports. To find such evidence, the ITC counted imports of semi-finished steel slabs. Since these slabs were brought into the United States by the domestic mills themselves, how could the ITC claim these slab imports harmed the same mills? By this point, you can make an educated guess.

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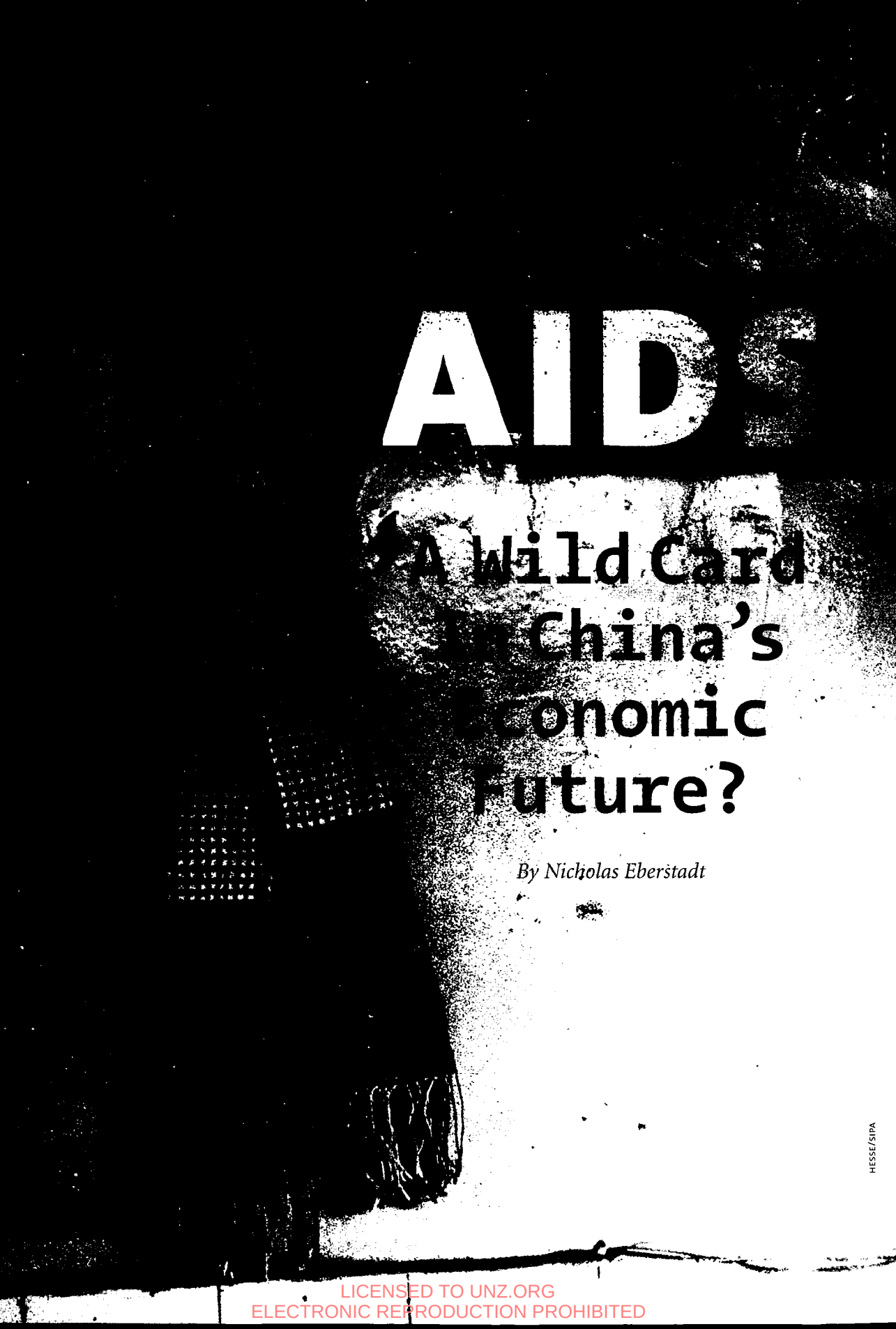
AIDS: A Wild Card in China's Economic Future?

By Nicholas Eberstadt



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Could epidemic illness –

in particular, HIV/AIDS – derail China's economic locomotive? No one, of course, can say with certainty. But a close look suggests that the country's economy is far more vulnerable to such a tragedy than one might expect from a country with a sterling record of growth – not to mention great success in controlling disease.

Accurate birth and death records for China are really only available for a small portion of the country – a handful of major cities – and the quality of demographic data from census returns and other national surveys is a matter of debate. Even without comprehensive statistics, though, it is clear that China has managed a dramatic transformation of public health since the Chinese Communist Party's takeover of the mainland in October, 1949.

In the early 1950s, according to reconstructions by independent scholars, life expectancy in China was under 45 years; by 2000 it was probably about 70 years. Thus, in less than two generations, life expectancy has jumped by over a quarter century. An alternative estimate by the United Nations Population Division suggests an even greater improvement in life expectancy – an increase from 41 years in 1950-55 to about 70 in 1995-2000. And if we were to use the date of the Communist revolution as the starting point, China's long-term performance is even more striking. According to official (but not implausible) calculations, China's life expectancy at birth in 1949 was only 35 – implying close to a 36-year surge between 1949 and 2000.

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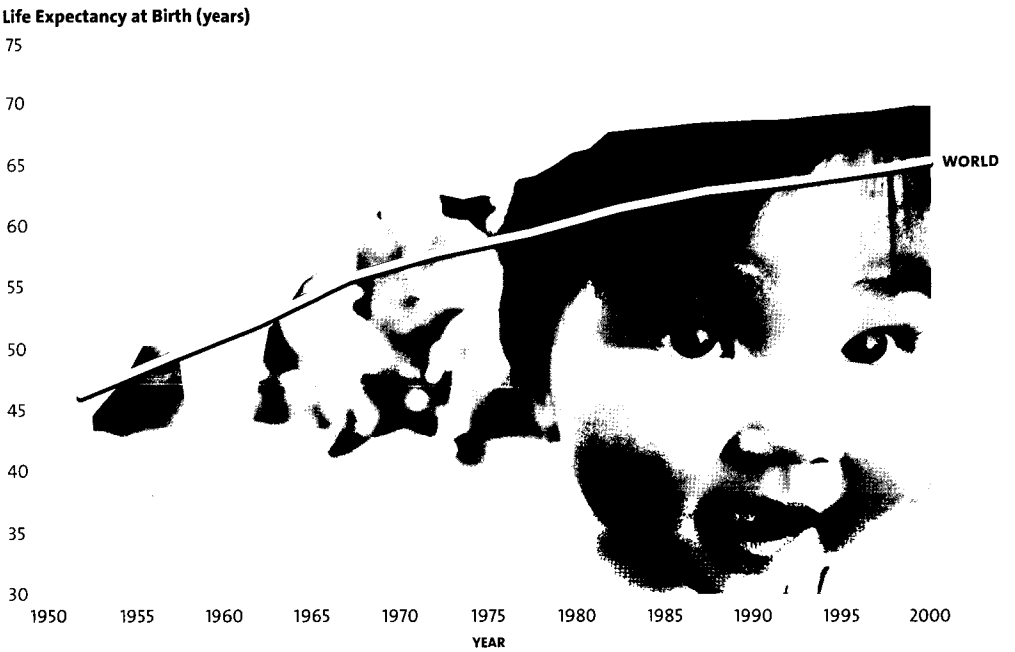
LIFE EXPECTANCY 1950 – 2000: CHINA VS. THE WORLD



The road to low mortality in China, we should note, was not without detours. After Mao's Great Leap Forward campaign of 1957-8, China plunged into catastrophic famine from 1959-62. Yet China's long-term improvements in life expectancy were still far greater than those for the rest of the world taken as a whole. In the early 1950s, expectation of life at birth in China was below the world average; by the late 1990s, it was about four or five years above it.

Communist China's progress in improving public health is in large measure the consequence of its success in controlling infectious disease. Although China lacked comprehensive and reliable cause-of-death statistics in the 1950s (and still lacks them today), a strong correspondence between overall mortality levels and the distribution of the causes of death has been interpolated using data from other countries. According to those statistical models, a reduction of age-standardized death rates from about 25 per thousand to about 10 per thousand – China's accomplishment between the early 1950s and the late 1990s – is in large part due to the decline in deaths from infectious and parasitic disease, notably influenza, tuberculosis and cholera.

Although much of Communist China's progress against disease was achieved in the Maoist era, morbidity and mortality due to disease continued to decline after the historic 1978 turn toward markets. The demographer Judith Banister notes that age-specific death rates for Chinese children ages 1 to 4 fell by half between 1981 and 1995. She attributes the

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change to a combination of immunization campaigns and improvements in rural drinking-water supplies.

Other indicators of epidemic disease have signaled continuing, and sometimes major, improvements. Between 1983 and 1997, for example, the annual number of cases of malaria reported to the World Health Organization fell from 265,000 to just 27,000.

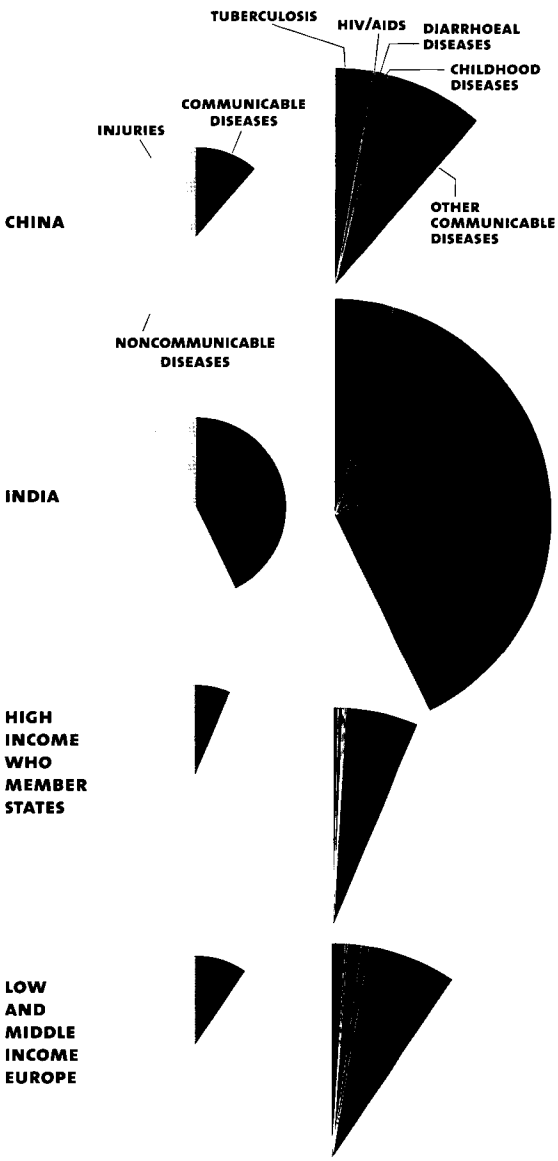
CHINA'S HEALTH TODAY

As part of an effort to quantify the burden of disease, WHO researchers have worked to detail cause-of-death patterns for major regions of the world, and also to estimate disability-adjusted life years (DALYs) – a new composite measure reflecting the combined impact of mortality, illness and injury. Their findings are not universally accepted; any metric that weighs the burden of disease necessarily relies on arbitrary assumptions. Whatever their shortcomings, though, their numbers are illustrative.

The exhibit to the right shows WHO's estimate of the proportion of deaths in 1998 due to specific diseases in China and three other regions of the world. The first benchmark is India – Asia's other demographic giant, and a rising economic and geopolitical power in its own right. The second consists of the post-Communist states of Europe. The third consists of the high-income WHO member-states, with some 900 million residents in North America, Western Europe, Japan, Australia, New Zealand and a handful of smaller countries.

According to WHO, communicable conditions accounted for about 5 percent of China's fatalities in 1998. That figure is distinctly larger than the negligible 1.5 percent of deaths linked to infectious and parasitic disease in high-income countries. But it is much smaller than the roughly 23 percent of

MORTALITY BY CAUSE OF DEATH, 1988



India's mortality attributed to communicable conditions. The role of infectious and parasitic illnesses in China's overall death patterns is similar to that of the former Soviet bloc, although communicable diseases account for

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a slightly higher share of overall mortality in China.

As of 1998, China's five leading infectious/parasitic causes of death accounted for 4.4 percent of total deaths. In India, by contrast, the top five accounted for about 19 percent of overall mortality, while in post-Communist Europe the corresponding share was 3 percent.

WHO's new summary measure for health, the DALY, aggregates mortality, illness and disability into an index. Per capita DALYs for China and the three other groupings in 1998 are shown in the figure on page 19. China's overall health profile is much better than India's – and the burden of illness due to infectious and parasitic diseases accounts for most of the difference. Interestingly, the WHO numbers suggest that China's overall burden of disease is actually lower than that of post-Communist Europe, although the proportion of the overall burden due to communicable disease is roughly comparable.

Contemporary China has thus attained a health profile with respect to infectious and parasitic illnesses that is unusually favorable for a country of its income level. Indeed, China's current infectious-disease profile would be somewhere between that of Western and Eastern Europe.

Note, however, that the numbers for China represent an average of disparate regions. As of 1982, the latest year with comprehensive statistics, China's healthiest region (Shanghai) enjoyed a life expectancy at birth roughly 15 years higher than its least healthy province (Xinjiang). Tibet is excluded from the calculations.

In regions accounting for roughly a fifth of China's total population, life expectancy was 70 or higher; in another fifth, it was 65 or lower. Generally speaking, public health was

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best in the country's major municipalities and along the coast, and worst in the inland provinces – especially in rural areas. It would be reasonable to assume that the distribution of the communicable disease problem in China follows the same general pattern.

THE RISKS OF BEHAVIOR-DRIVEN COMMUNICABLE ILLNESSES

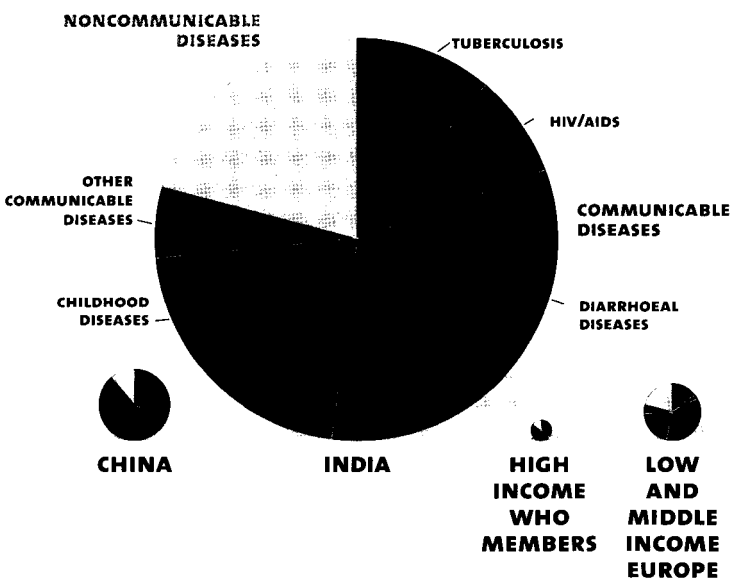
Serious problems with infectious disease – most notably tuberculosis, which still claims 250,000 lives a year in contemporary China – assuredly persist. The extensive if rudimentary socialized health care system of the Maoist era has given way to a system that is largely pay-for-service and full of coverage gaps, especially in rural areas. With the aging of China's population, moreover, the question of how to finance medical treatment for chronic conditions and diseases of the elderly – largely unresolved today – will become increasingly pressing.

For all those shortcomings, though, China's public health performance must be recognized for its stunning achievements. China appears to have a fairly workable model in place for dealing with water-borne, air-borne and food-borne infections. A public health disaster in China could follow a major systemic dislocation – for example, the collapse of central administrative authority. But such a hypothetical public health disaster would be secondary to a broader societal collapse.

China's impressive record to date does not, however, guarantee that an emerging epidemic would be handled with equal efficacy. For the threats looming on the Chinese public health horizon look to be behavior-born, and behavior-born disease may be more difficult for the Chinese system to contain. The primary threat of this type today is, of course, HIV/AIDS.

Because the overwhelming majority of HIV cases in China are undocumented and untreated, figures on the total cases and new cases among its roughly 1.3 billion people rely heavily upon guesswork. In August 2001, Beijing health authorities announced that 600,000 Chinese were HIV-positive as of 2000. In July 2002, the Joint United Nations Program on HIV/AIDS put the total number of people living with the disease in China at 850,000 – a figure with which Beijing, at the time, concurred. Just two months later, however, the head of the Chinese Health Ministry's Department of Disease Control raised the official estimate to one million.

ESTIMATED BURDEN OF DISEASE, 1998



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Other sources suggest the total may be far higher.

A June 2002 report by the UN Theme Group on HIV/AIDS put China's 2001 HIV population at between 800,000 and 1.5 million. The U.S. intelligence community, for its part, places China's year 2002 HIV-positive population at one million to two million. Nor is this the upper boundary of informed guesswork.

Beijing has attempted to suppress public discussion of the failure to control the medical use of tainted blood, arresting activists working on the HIV-commercial blood sales issue, and shutting down their Web sites.

Last June, an unidentified UN official told *The New York Times* that there could be as many as six million HIV cases in China. And according to some claims, the province of Henan alone might already have 1.2 million HIV-carriers. Indeed, it is possible that China now has the largest HIV population of any country.

Whatever the true figure, there is little doubt that totals are rising very, very swiftly. Both Chinese and UN authorities suggest that the prevalence of HIV in China has been increasing by about 20 to 30 percent per annum in recent years; for its part, the U.S. Centers for Disease Control and Prevention cites estimates of a current doubling time of 30 months.

To date, the Chinese HIV epidemic appears to be predominantly heterosexual in disposition, and the risk of HIV in China appears to be disproportionately high among the poor, the uneducated and the rural. At-risk groups may also include the so-called floating population – the 100 million or more unauthorized migrants from rural regions seeking opportunity on the fringes of Chinese urban life – and the "unmarriageable males" – the rising numbers of young men in China who, due to the country's growing youth gender imbalance, have no realistic prospect of securing a bride.

At this juncture, then, it seems very likely that China's HIV/AIDS problem will worsen considerably in the years ahead – in part because of choices made by Chinese policy makers, in part because of the limited options open to policymakers.

To date, the Chinese government's response to its mounting HIV crisis has been piecemeal. Not to mention, fierce: it includes the segregation of HIV carriers and the proposed criminal prosecution of HIV sufferers for the activities that lead to infection. This draconian approach naturally encourages HIV carriers to evade detection and to misrepresent their health status, thereby fueling the epidemic.

Beijing has also attempted to suppress public discussion of the failure to control the medical use of tainted blood, arresting activists working on the HIV-commercial blood sales issue, and shutting down their Web sites. As the outbreak of Serious Acute Respiratory Syndrome (SARS) plainly illustrates, an epidemic cannot be controlled by censorship.

In contemporary Asia, perhaps the most successful HIV-control campaign thus far has been in Thailand. Whether China could repli-

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cate a Thailand-style anti-AIDS policy is by no means clear, for analyses of the Thai program by the World Bank and others have stressed the role of "civil society" in the Thai strategy. Nongovernmental organizations were central to the prevention campaign, and popular trust in the government apparently lent credibility to the state's own education effort. A public health campaign premised upon the independence of non-state actors and the population's confidence in its government could be rather more problematic for Beijing.

In any case, it is worth noting that Thailand's exemplary AIDS campaign did not immediately check the epidemic. By UNAIDS' reckoning, Thailand's HIV-positive population continued to increase for about a decade after the implementation of the country's aggressive anti-AIDS strategy, almost tripling in the interim.

China's response to its HIV crisis may also be circumscribed by economic considerations. Not the least of these concerns is what bean counters would call the "net present value" of treatment for HIV carriers.

For now, the most effective medical intervention for prolonging HIV patients' lives is the Highly Active Anti-Retroviral Therapy (HAART, or drug cocktail regimen). The HAART regimen extends the AIDS-free life expectancy of HIV patients by several years, thereby permitting them to work.

In developed economies, the HAART treatment typically costs $10,000 or more per patient per year. The generic versions of those medicines can cost much less: in India, for example, Cipla Ltd. currently markets a year's supply of HAART medications for about $600. Yet even at tremendously discounted

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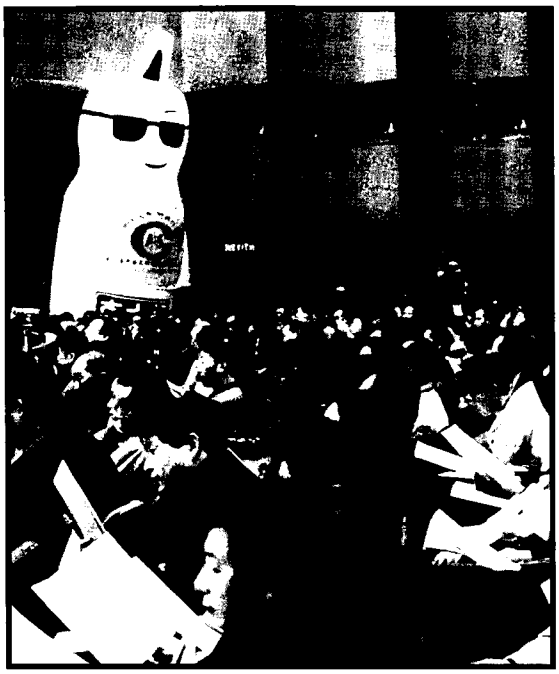


CHINE NOUVELLE/SIPA

prices, HAART would not necessarily prove to be an economic bargain for treating HIV-afflicted workers in low-income countries.

Under arbitrary but not unreasonable assumptions, the "social benefit" (through extended work life) of providing workers with generic HAART medications would only outweigh the social cost for those laborers who generated an annual output of several thousand dollars a year. Even if HAART treatments could be obtained gratis and dispensed at only the cost of the limited medical supervision entailed, workers earning much less than $1,000 a year would not be able to produce as much additional output for their society as their treatment would cost.

There are, to be sure, consequential differences in estimated output per worker in China, depending on whether one relies upon exchange-rate-based comparisons or the alternative purchasing-power-parity techniques. Irrespective of the approach, though, it is clear that a substantial fraction of those at risk in China today would not qualify as candidates for HAART therapy on the basis of social cost/benefit calculations alone.

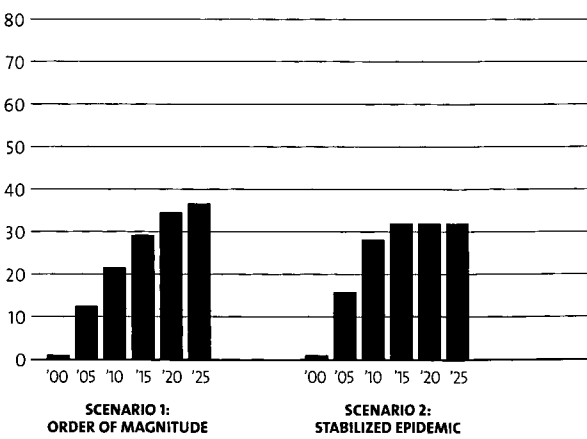
POSSIBLE TRAJECTORIES FOR AN HIV EPIDEMIC IN CHINA

Public health specialists and epidemiologists have not yet developed robust techniques to predict the unfolding course of the epidemic with any degree of precision. Indeed, they still lack even the detailed epidemiological data that would allow them to explain convincingly the mechanisms of HIV transmission within low-income heterosexual populations.

We thus cannot presume to predict the course of China's HIV/AIDS epidemic. We can, however, illustrate the likely demographic outcomes that would follow from reasonable assumptions. For each scenario, we assumed that 1) China's AIDS epidemic began in 1985; 2) the median period between HIV infection and the onset of AIDS is nine years; 3) life expectancy with AIDS averages two years; 4) the age-sex distribution of China's HIV epidemic conforms to the heterosexual model observed in sub-Saharan Africa.

In our scenarios, we modeled six hypo-

HIV/AIDS CASES IN CHINA (MILLIONS)



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thetical trajectories for the period 2000-25. For midyear 2002, we assumed that just over two million adult Chinese were infected. We further assumed that the true HIV prevalence figure for 2000 was one million.

Six HIV/AIDS scenarios were then modeled for the 2000-25 period:

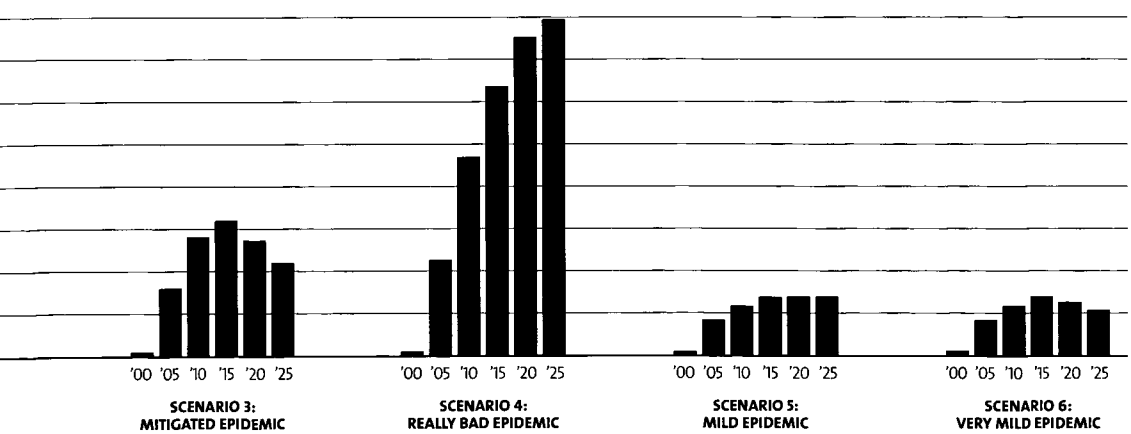
1. "Order of Magnitude Increase," with HIV prevalence steadily rising from 0.14 percent to 4.0 percent of the adult population.
2. "Stabilized Epidemic," with HIV prevalence rising to 3.5 percent in 2015, then holding steady.
3. "Mitigated Epidemic," with HIV prevalence rising to 3.5 percent by 2015, and then declining to 2.0 percent by 2025.
4. "Really Bad Epidemic," with HIV prevalence rising rapidly, to 9.0 percent in 2025.
5. "Mild Epidemic," where HIV prevalence rises to 1.5 percent by 2025.
6. "Very Mild Epidemic," where HIV prevalence rises to 1.5 percent by 2015, and then declines to 1.0 percent by 2025.

One way of putting these hypothetical trajectories in perspective is to compare them with projections and estimates of HIV prevalence for other countries and regions.

Only one of our scenarios, Really Bad Epidemic, posits an eventual adult HIV prevalence rate as high as those in the U.S. Census' "Low Scenario" model for HIV paths in urban Africa. The 9 percent adult HIV prevalence rate that the Really Bad Epidemic ascribes to China in 2025 can be further compared against UNAIDS' estimate of a sub-Sahara-wide prevalence rate of 8.8 percent for year-end 2002.

Of the five remaining scenarios, only one (Order of Magnitude Increase) posits an eventual adult HIV prevalence rate as high as that estimated by UNAIDS for Cambodia as of year-end 1999. And in two of the scenarios (Mild Epidemic and Very Mild Epidemic), the prevalence rates presumed for China's HIV epidemic never reach the levels of contemporary Thailand.

The actual trajectory of China's HIV epidemic will be established by patterns and mechanisms of transmission, the prevalence of risky behaviors and practices among the general public, and the efficacy of the government's anti-AIDS strategies – information we cannot know today. However, each of these six scenarios is well within the historical experience of other societies – and thus, none of them is implausible on its face.



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Under all of the scenarios, China's HIV epidemic qualifies as a humanitarian tragedy of devastating magnitude.

What would these various HIV trajectories suggest about the unfolding of the AIDS epidemic in China in the years immediately ahead?

Under our most pessimistic scenario, China would have almost 80 million HIV-carriers by 2025, while under the most optimistic, the number would reach 11 million. Looking to the medium-term – that is, to 2015 – the optimistic trajectories posit a total HIV-positive Chinese population of about 14 million and the pessimistic scenario runs to over 60 million.

Thus, China could soon have a far larger HIV-positive population than any other country. In fact, in four of the six scenarios shown in Figure 4, China's HIV population in 2015 would approach or exceed the entire estimated HIV population of sub-Saharan Africa today.

The table below shows the cumulative AIDS deaths implied by the six scenarios. By our estimates, China had only suffered about 20,000 AIDS deaths as of 2000. But given the cruel arithmetic of the epidemic, those totals explode in every one of our scenarios.

By 2010, every one of our scenarios implies a cumulative total of four million or more AIDS deaths; the "pessimistic" trajectory reaches about 12 million. By 2015, our scenarios imply a cumulative total of 10 to 37 million AIDS deaths. Put another way, our scenarios envision AIDS deaths for 2010-15 of 1.2 million per year on the low side and about five million a year on the high side. China's *total* mortality in 2000 was just under nine million.

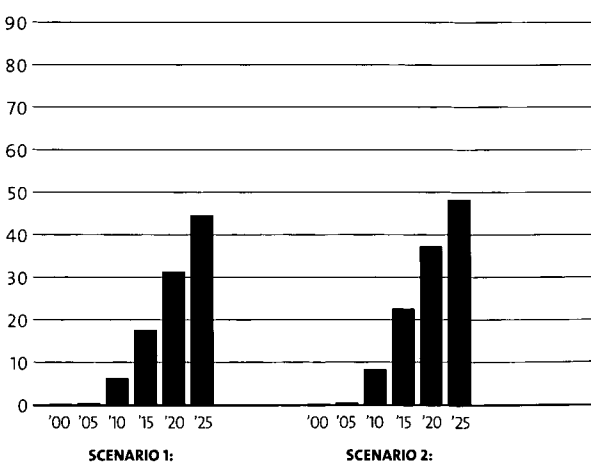
By 2020-25, under our most pessimistic trajectory, China would be suffering almost six million AIDS deaths a year. By the arithmetic of the intermediate scenarios, annual AIDS deaths would total 2.2 million to 2.6 million. By 2025, cumulative AIDS mortality for China in every modeled scenario would exceed 20 million – nearly the total number of deaths experienced by all of humanity in the first two decades of the global HIV pandemic.

ECONOMIC IMPLICATIONS OF AN HIV BREAKOUT

Under all of the scenarios, China's HIV epidemic qualifies as a humanitarian tragedy of devastating magnitude. Will economic tragedy follow from humanitarian tragedy?

Economies do not necessarily fare poorly during sudden, brutal bouts of mortality. During World War II, for example, the output

CUMULATIVE AIDS DEATHS (MILLIONS)



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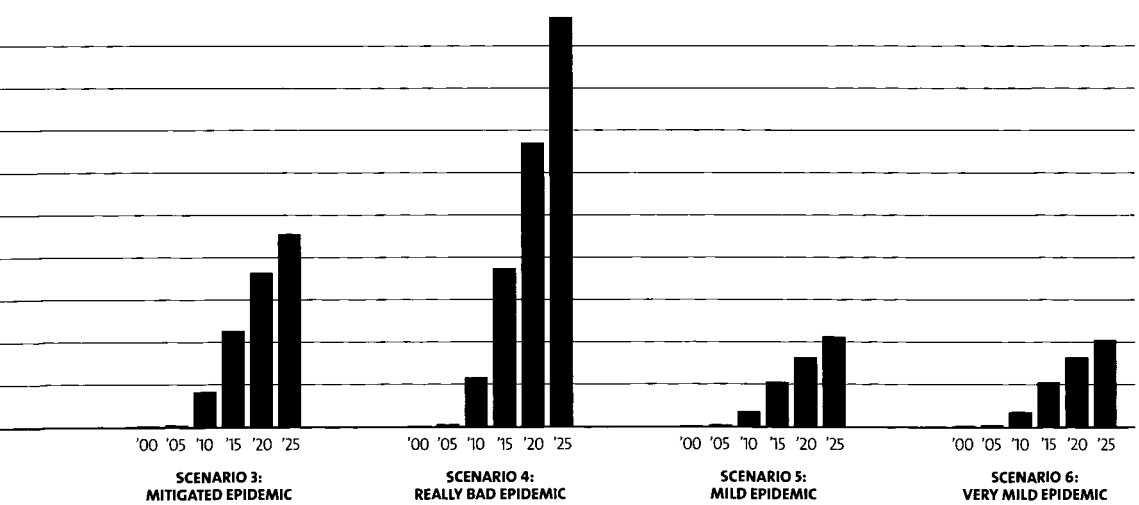
of most of the major combatant powers increased significantly during the first years of hostilities, despite sharply increased death rates for people of productive age. Note, too, that standard models of economic development suggest that the loss of low-productivity workers from the traditional agricultural sector imposes only minimal losses on the overall economy. And it is precisely this segment of Chinese society that is at greatest risk.

To date, relatively little research has been devoted to the macroeconomic implications of HIV/AIDS – and most of that work has focused on the sub-Saharan region. Thinking about this issue is thus in a very early stage.

In particular, two potential economic ramifications of an HIV/AIDS epidemic in a low-income setting have, as yet, received little attention. First, by foreshortening adult lifespans, a widespread HIV epidemic would seriously alter the calculus of investment in higher education and technical skills – thereby undermining investment in human capital. Second, widespread HIV prevalence could affect international decisions about direct investment, technical transfer and managerial encampment in locales perceived to be risky places to live. Indeed, an HIV breakout could isolate the afflicted countries. And the long-run economic impact could potentially be even more significant than the constraints the epidemic imposes on supplies of labor and/or local savings.

An accurate calculation of the prospective economic cost of HIV/AIDS would be an extraordinarily exacting task. A very simple, but nonetheless instructive, way of thinking about the economic implications of an HIV breakout in China is to approach the problem with a health-based productivity model. In modern times, there has been a robust correspondence between health and productivity at the national level. This association holds both across nations at any given time, and within countries over time.

A simple curve-fitting exercise plotting World Bank estimates of per capita output (in purchasing power terms) against life expectancy at birth captures two-thirds of the variance in output. By the same token, a simple regression of life expectancy and per capita output in China for the period since the



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end of the Great Leap famine in 1963 captures over 70 percent of the variance in output. In both the snapshot international data and the longitudinal Chinese data, simple curve-fitting suggests that a single year's increase in life expectancy at birth is associated with an increase in per capita output of about 8 percent.

On the one hand, wealth gives households the ability to pay for a healthier life. On the other, improvements in health can boost productivity by extending potential work-life, enhancing physical capacity, facilitating learning, and contributing to human capital deepening. Yet while the interactions between health and productivity are manifestly intricate and multi-directional, the brute fact is that for any country, at any point, life expectancy has been a fairly good predictor of per capita output.

The brute fact is that for any country, at any point, life expectancy can be trusted as a fairly good predictor of per capita output.

For health-based productivity predictions, we need to quantify HIV's impact on public health. In two of the six scenarios, life expectancy at birth in China would be lower in 2025 than it is today. Even under the most optimistic scenario, life expectancy in 2025 would be three years lower than the baseline projection.

The situation is, in some ways, even starker for 2015. Four of the six scenarios imply a lower life expectancy than in 2002; in the other two scenarios, life expectancy in 2015 would be barely higher than 15 years earlier. Indeed, in 2015 life expectancy under these six scenarios would be between four and 12 years lower than the baseline Census Bureau series would have projected.

If we assume that – a big assumption, indeed – one year of improved life expectancy continues to be associated with about an 8 percent increase in per capita GDP in the years ahead, the HIV epidemics hypothesized in this chapter would cut China's long-run (2000-25) GDP growth per person 15-64 years of age by about 0.5 to 0.7 percent per year in the optimistic scenarios, by over 3.5 percent per year in the most pessimistic scenario, and by 1.5 percent-2.5 percent in the intermediate scenarios. For 2015, corresponding calculations imply reductions in per capita growth ranging from 1.5 percent per annum to over 5 percent per annum, with intermediate scenarios exceeding 2.5 percent per annum.

We should note that the health-based productivity approach yields much lower growth rates than the standard economic projections. Using Census Bureau figures as a baseline, the health-based approach would imply a per capita increase in output of just 1.9 percent per annum for 2000-25.

Clearly, these projections are sensitive to a number of assumptions. The underlying point, however, is less open to contention: if health levels in China are severely affected by an HIV/AIDS epidemic and the country's health levels remain closely related to the country's economic potential, economic growth in China will suffer correspondingly. HIV/AIDS could thus be the wild card in China's economic development.

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The Really Bad News About Retirement Policy

By Steven A. Nyce and Sylvester J. Schieber

MICHAEL SIPE

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The aging of most of the world's population has been driven largely by increases in life spans – welcome news, indeed. And by no coincidence, it has been accompanied by the growth of organized retirement systems in affluent economies. Yet while it is nearly as hard to be critical of the generosity of these support systems as it is to wish to turn back the clock on life expectancy, the combination is raising concerns about the cost burdens that we will soon face from elderly dependency.

The World Bank's 1994 landmark report, *Averting the Old Age Crisis*, estimated that the G-7 countries (Britain, Canada, France, Germany, Italy, Japan and the United States) would, on average, have to increase taxes by an awesome 6.56 percent of GDP to finance their national pension obligations over the long run. A study seven years later by the European Commission and the Organization for Economic Cooperation and Development (OECD) suggested that considerable progress had already been made in reining in these financial liabilities – average public pension spending to meet existing obligations in the G-7 countries is now expected to be only 2.3 percent of GDP higher in 2050 than it was in 2000. But the same report added a new concern: the exploding cost of health care for the elderly. In Canada, for example, publicly funded health care costs for pensioners are expected to increase from 6.3 to 10.5 percent of GDP in the next half-century.

Moreover, as ominous as the new projections seem, they may well err on the rosy side. It now appears that many developed economies will experience prolonged periods in which the numbers of non-elderly will actually decline. In some cases, these declines are likely to exceed gains in worker productivity, implying that these societies face the prospect of declining standards of living. Allocating these reductions in income between workers and retirees will likely prove a severe test of democratic values.

THE BIG PICTURE

Stripped to the essentials, all retirement systems are mechanisms for dividing

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consumption between workers and retirees. Workers receive their share of output through wages, while the owners of capital receive theirs as returns to investments. Retirees are supported through ownership of capital, along with transfers – voluntary and involuntary – from workers and younger capital owners.

In a retirement model based purely on investment income, workers accumulate wealth by saving a portion of their earnings. They can do this by means of personal savings, or through formal retirement plans mandated by government, sponsored by employers or managed by some other cooperative entity. During retirement, retirees liquidate their assets.

Seen this way, retirement plans are mechanisms for transferring consumption rights across time, first by buying assets and then by selling them. In the parlance of actuaries, programs that provide for the accumulation of assets during the working career to finance participants' consumption during retirement are "funded" programs.

Transfers to support the elderly can be informal, with one generation of a family financing the previous generation. But most national governments sponsor formal intergenerational transfers. In the parlance of retirement financing, these plans are "pay-as-you-go" (pay-go) because they tax today's workers and transfer the resources to today's retirees. Discussions of the burden of supporting the elderly typically focus on the cost of government-sponsored pay-go retirement plans.

TABLE 1: CONSUMPTION AS A PERCENTAGE OF OUTPUT, SELECTED COUNTRIES

	1970	2000
Australia	59.1	59.5
Canada	56.8	55.9
Germany	51.5	56.6
Ireland	73.0	49.6
Japan	54.6	54.1
Mexico	75.1	69.1
South Korea	68.0	50.6
Turkey	76.9	68.0
United States	64.8	67.7

TABLE 2: PERCENT OF POPULATION 60 OR OLDER

	2000	2030 (est)
Australia	16.3	26.0
Canada	16.7	29.1
Germany	23.2	36.1
Ireland	15.2	22.1
Japan	23.2	36.9
Mexico	6.9	15.8
South Korea	11.0	27.3
Turkey	8.4	15.8
United States	16.1	25.8

In both approaches, though, workers finance retirees' consumption by giving them a share of what they produce. With funded plans, workers do this by purchasing assets that retirees sell. With pay-go retirement systems, workers pay taxes to finance pay-go retirement plans. Many governments have opted for pay-go systems, typically because pay-go makes it possible to pay full benefits on day-one. By contrast, funded plans depend on workers' decades-long accumulation of assets.

With either approach, rapid population aging is bound to reduces somebody's standard of living. There are at least two kinds of costs to consider in this regard. The first has to do with the burden that a retirement system places on productive assets. The second has to do with the "opportunity costs" imposed on the economy – the extent to which the specific structure of a retirement program (the mandated age of retirement, for example) affects the handful of factors that define the legal retirement burden.

Consumption Levels in the Developed Economies

The first of these factors is the consumption rate – the ratio of total consumption to total

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economic output. Economists have long studied the relationship between income and consumption. One general conclusion is that the long-term relationship between the two is fairly constant. Indeed, for nearly all the economies shown in Table 1, consumption has remained on track over the last four decades.

Some less-developed economies – Ireland, Mexico, Turkey – that have grown rapidly in recent decades have seen a fall in consumption rates, as a higher proportion of income is plowed back into savings. But these are exceptions. In most cases, the relatively stable relationship has held up under economic, demographic and political stress. Thus Japan, which developed quite rapidly in the postwar era only to face economic stagnation in the last decade, has not changed its consumption rate.

TABLE 3: AVERAGE ANNUAL GROWTH IN GDP

	1970s	1990s	2010s (est)
Canada	4.29	2.71	1.59
Germany	2.72	2.66	1.44
Ireland	4.73	7.08	3.00
Japan	4.43	1.36	1.05
South Korea	7.59	6.10	4.20
United States	3.20	3.34	2.22

The Implications of Aging on Consumption

While consumption has remained roughly a constant proportion of income for entire economies, individuals' consumption varies greatly across their lives. In what economists call the "life-cycle model," the young consume more than their income as they invest in education, start a family and the like. During middle-age they become savers, paying off debts and then accumulating wealth for retirement. The elderly, of course, consume assets accumulated earlier.

The life-cycle model implies that older retirees (who have had more time to spend down assets) ought to possess less wealth than younger retirees. But several studies have found just the opposite. Measurement is complicated by the likely correlation between wealth and life expectancy. If poor people die at younger ages, the growth in wealth from one age group to the next in the cross-section might simply reflect differences in mortality rates. Note, too, that, in the case of the United States, Social Security has provided larger windfall benefits to some age groups than to others – and thus may have given earlier recipients an incentive to spend down their savings more rapidly.

If the general conclusion is that people tend to save during their working lives and to dissave during retirement, differences in the age structure across countries or variations in age structures across time should have significant implications for macroeconomic performance. The aging of populations should lead to lower national savings rates, which in turn should lead to less investment – and, eventually, to declines in living standards. So far, there is not much evidence of this. But the jury is still out: we have not reached the rates of aged dependency that are certain to develop over the next couple of decades.

Retirees as a Share of National Populations

If average age for retirement does not change over time, calculating the effects of aging on the retirement burden is straightforward. For example, if we were to assume that the retiree population in Japan was comprised of all people over age 55 who were not economically active, the retirees in 1995 would have equaled roughly 15 percent of the population. Applying the 1995 rates of economic inactivity for those over 55 to the projected age composition of the Japanese population suggests

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that 26 percent of the total population will be retired in 2030. Hence one sees the potential value of the data in Table 2, which shows the percentage of the populations over age 60 in the selected countries for 2000 and the three decades following.

Table 2 can only suggest retirement burdens, present and future. For one thing, many people retire in their late 50s, while others work into their 60s. Besides, retirement patterns may well change. Many countries have been increasing the age of eligibility for public pension benefits or otherwise offering financial incentives to stay on the job. Still, the conservative projections in the table are probably a good indicator of the trends in the retirement burden. And they suggest that, in most of the developed economies, the retirement burden rate will increase by about half over the next three decades – and in some cases, by considerably more.

TABLE 4:
AVERAGE ANNUAL GROWTH IN LABOR PRODUCTIVITY

	1960s	1990s	Late 1990s
Australia	2.66	2.05	2.27
Canada	2.26	1.44	1.59
Germany	4.25	1.50	1.09
Ireland	4.21	3.31	3.95
Japan	8.63	1.10	1.46
Mexico	0.13*	0.29	1.71
South Korea	3.86**	4.55	4.23
Turkey	4.63	2.53	3.26
United States	2.26	1.52	1.96

*1980s **1970s

TABLE 5:
AVERAGE ANNUAL GROWTH IN LABOR SUPPLY

	1960s	1990s	2010s (est)
Australia	2.49	1.34	0.38
Canada	2.66	1.17	0.09
Germany	0.15	0.69	-0.65
Ireland	0.00	2.87	0.39
Japan	1.34	0.58	-0.50
South Korea	2.82	1.70	0.32
United States	1.74	1.13	0.46

Retiree Consumption Levels

The third crucial factor in defining retirement burdens is the ratio of average retiree consumption to average consumption for the whole population. In one regard, it is the most revealing variable, because it has the potential to show the relative effects of rising retiree burdens on both retirees and the remainder of society.

If personal consumption remains relatively stable as a portion of GDP over the next couple of decades in the aging societies, economic growth will largely drive what happens to living standards. Table 3 shows GDP growth for the selected countries back to the 1960s, along with projections of growth for this decade and the next. Overall, the rate of growth has not changed much in the past few decades. There is good reason to believe, however, that it will slow considerably in the 2010s.

As a matter of arithmetic, growth in total economic output is determined by the combination of worker productivity and the size of the work force. As Table 4 shows, there is no universal trend to suggest either faster or slower productivity gains down the road. Some people believe that technology and capital "deepening" – an increase in the average amount of capital per worker – will lead to acceleration in productivity gains. Others worry that aging work forces will depress the rate of productivity improvement.

Table 5 shows the historical rates of growth in the labor supply for the OECD countries. We projected future growth using United Nations population projections by age and gender, and applying the current labor force participation rates to future years. This may result in a slight underestimate of actual growth because younger women may partici-

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pate at higher rates as they age than older women do today. But our analysis suggests this will not offset the clear trend toward much slower labor force growth. In some countries, labor forces will actually shrink.

Table 6 shows estimates of GDP growth for some major economies, along with alternative estimates based on the assumptions that worker productivity continues to grow at the 1990s rate and that the labor force grows in accord with our estimates. In countries with severe aging problems – for example, Germany and Japan – slower growth in output could have a profound effect on standards of living. Indeed, if the most optimistic predictions do not prove accurate, these societies will face the question of who bears the brunt of demographically driven scarcity. The character of the retirement systems in many countries will have a lot to do with the answer.

TABLE 6:
ESTIMATED GROWTH IN REAL GDP AT HISTORICAL PRODUCTIVITY GROWTH RATES UNDER CURRENT WORK FORCE PATTERNS

	REAL GDP GROWTH OECD ESTIMATES		PRODUCTIVITY GROWTH	ESTIMATED GROWTH IN GDP AT 1990s PRODUCTIVITY GROWTH	
	2000–2010	2010–2020	1990s	2000–2010	2010–2020
Australia	—	—	2.05	2.93	2.43
Canada	2.22	1.59	1.44	2.17	1.55
Germany	2.21	1.44	1.50	1.44	0.85
Ireland	4.60	3.00	3.31	4.59	3.71
Japan	1.22	1.05	1.10	0.84	0.60
Mexico	—	—	0.29	2.32	1.73
South Korea	5.84	4.20	4.55	5.51	4.87
Turkey	—	—	2.53	4.25	3.79
United States	2.96	2.22	1.52	2.43	1.99

THE ROLE OF RETIREMENT SYSTEMS IN DETERMINING RETIREMENT BURDENS

In many countries, benefits granted to those already retired are tied to growth in current labor productivity through some form of indexing to current wage rates. Even where pension benefits are tied to the general growth in income or to the cost of living, the explosive increase in the cost of retirees' health benefits tends to increase the cost of benefits at rates approaching that of wage growth.

Where retirees are largely dependent on pensions linked to current workers' wages, pension systems may actually insulate retirees from a slowdown in the economic growth that is likely to result from population aging. Here, it follows as a matter of arithmetic that workers and their young dependents face the prospect of seeing their consumption grow more slowly than the pace of productivity gains. That is, some of the fruits of their greater productivity would go to retirees, as workers pay higher taxes to support public pensions or voluntarily save more by purchasing more assets from retirees. It also implies that workers' living standards will not only grow more slowly than their productivity, but will also grow more slowly than the living standards of retirees.

We estimated the growth in total consumption over the current and next decades, assuming that national savings rates remain constant. We then distributed consumption between retirees on the one hand and workers and their young dependents on the other, assuming that the retired population consisted of everyone over age 60.

To divide total consumption between the two groups, we developed estimates of consumption by age based on household survey data. The result is a characteristic hump-shaped consumption profile, with household expenditures peaking with the 45-to-54 year olds. Note that while middle-aged individuals

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In countries with severe aging problems, slower growth in output could have a profound effect on standards of living.

SCENARIO 1:
THE YOUNG BEAR THE BURDEN OF AGING POPULATION AND SLOWER PRODUCTIVITY GROWTH

	TOTAL CONSUMPTION PER CAPITA 2010–2020	ACTIVE WORKERS AND DEPENDENTS PER CAPITA 2010–2020	ELDER POPULATION PER CAPITA 2010–2020
Australia	1.63	1.64	2.05
Canada	0.83	0.84	1.44
Germany	1.04	1.04	1.50
Ireland	2.78	2.75	3.31
Japan	0.78	0.78	1.10
Mexico	0.70	0.81	0.29
South Korea	4.50	4.66	4.55
Turkey	2.78	2.86	2.53
United States	1.17	1.23	1.52

SCENARIO 2:
THE ELDERLY BEAR THE BURDEN OF AGING POPULATION AND SLOWER PRODUCTIVITY GROWTH

	TOTAL CONSUMPTION PER CAPITA 2010–2020	ACTIVE WORKERS AND DEPENDENTS PER CAPITA 2010–2020	ELDER POPULATION PER CAPITA 2010–2020
Australia	1.63	2.12	-0.23
Canada	0.83	1.51	-1.48
Germany	1.04	1.61	-0.42
Ireland	2.78	3.14	1.13
Japan	0.78	1.32	-0.34
Mexico	0.70	1.04	-2.30
South Korea	4.50	5.25	1.08
Turkey	2.78	3.11	0.03
United States	1.17	1.74	-1.04

consume the most, their savings rate is also the highest. The apparent contradiction is resolved by the fact that they have the highest incomes.

To distribute total consumption between retirees and others, we applied the average consumption profile to the population age distributions for the countries in our analysis. In our baseline Scenario 1 we allowed the retiree group's income to grow at the pace of worker's earnings productivity improvement – implying that the average retiree's consumption will also grow in lockstep with labor productivity.

As the retiree population grows as a fraction of the total population, it will extract an ever-larger share of productivity gains. Thus, growth in total consumption by retirees will outstrip the growth in consumption for the rest of the population.

In Scenario 1, the burden of population aging falls directly on the workers and their young dependents. Workers' living standards grow much more slowly than the economy as a whole.

In what looks like an anomaly, per capita consumption in some countries grows more rapidly than GDP growth over both decades and, at least during the current decade, the younger population appears to do quite well. But much of this improvement only takes place because the younger population is shrinking – during this decade, the number of people in the under-60 group is expected to decline by 6 percent. In the 2010s, the number of people in this group is expected to decline another 9 percent.

In the long term, however, developed economies will not be able to improve living standards if productivity gains do not outstrip declines in the number of workers. The increasing portion of those in the 20 to 60 age

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range who are working, along with falling numbers of children per woman mask this problem for a while. But as the scenario plays out, someone must take the hit.

One likely reaction to the pressures illustrated by this baseline scenario will be to cut pension benefits. Britain has already moved from wage-indexed retirement benefits to benefits that are fixed in real terms at retirement. Other countries, including Germany, Italy and Sweden, have already adopted alternative measures to restrict the growth of their retirement systems.

In Scenario 2, we show what happen if we make the polar opposite assumption – that the entire burden of slowing economic growth is borne by retirees. We assumed that the workers' standard of living would fully reflect their improving productivity. Retirees get what is left.

Here, retirees in the United States would see their benefits decline by roughly 1 percent per year over the decade, while those in Canada would see their benefits erode by a whopping 1.5 percent per year. Later, the picture becomes even bleaker for retirees.

While the outlook for the group bearing the risk appears dire in each of the scenarios, policymakers would still have options to cushion the blow. One would be to extend retirement ages – thereby both reducing the number of retirees and increasing total output. To this end, Sweden, the United States and Belgium have all increased the normal retirement age, while other countries (among them, Germany) are slowly increasing the age at which retirees get full benefits. The private sector could also play a part – for example, by designing pension benefits so older workers have incentives to stay on the job.

The problem is that raising labor force participation by seniors will not be sufficient to keep most countries out of trouble. Consider the United States, where about 80 percent of those aged 50 to 54 were in the labor force in 2000, but the numbers trail off sharply thereafter. If this decline could be halved – if 75 percent of 55-59 year olds and 36 percent of 65-69 year olds worked – it would only increase the total size of the labor force by about 3.5 percent. Table 7 shows what later retirement could do for other countries.

TABLE 7:
THE BENEFITS OF KEEPING THE ELDERLY ON THE JOB

	TOTAL CONSUMPTION GROWTH UNDER CURRENT WORK FORCE CONDITIONS 2000–2010	TOTAL CONSUMPTION GROWTH WITH INCREASED WORK FORCE PARTICIPATION OF 60–64 YEAR OLDS 2000–2010
Australia	2.93	3.28
Canada	2.17	2.51
Germany	1.38	1.72
Ireland	4.42	4.77
Japan	0.84	1.18
Mexico	2.32	2.67
South Korea	5.51	5.86
Turkey	4.25	4.60
United States	2.49	2.84

CONCLUSIONS

Longer life expectancy and declining fertility portend a prolonged period in which the elderly will become an ever-larger portion of the population. But the implications go beyond that. It now appears that many of the developed economies will experience periods in which the numbers of non-elderly will decline.

Moreover, in some cases, these declines will exceed the rates of labor productivity growth – implying that societies face the prospect of declining living standards. Coping with the resulting problems will require far more substantial changes in society than has been generally appreciated. M

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Everything you wanted to know about Two Sided Markets*

*...but never knew to ask.

by David S. Evans and Peter Passell

Why did most of the dot-coms fail?

A no-brainer, you say? With hindsight, it does seem bizarre that otherwise-sane investors threw billions of dollars at a bunch of 20-somethings who knew more about grunge bands than broadband and regarded the concept of profit with the contempt once reserved for their fathers' Oldsmobiles. But the bubble aspects of dot-com mania have obscured what are arguably more profound economic changes that added to the woes of both Internet start-ups and more traditional businesses facing radical changes in the structure of markets.

Success in commerce often demands insight into markets in which the value of the product to one group depends on the value of another product to another group. To take a trivial example, a dating service can't make money from males aged 35-44 seeking females aged 25-34 who love Italian art and extreme sports unless their female counterparts have also signed up for their service. And, of course, vice versa.

Such "two sided" markets are not unique to the Internet, or even to what used to be called the New Economy. Magazines for skiers (or coin collectors or sports car nuts) must price the distinct services provided to readers and to advertisers in ways that keep both on board. Real estate brokers face a similar problem in making their services

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JONATHAN CARLSON

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attractive both to house buyers and sellers. Likewise, payment card companies must distribute lots of plastic and induce consumers to use it – which is possible only if lots of merchants are willing to accept the cards.

But a variety of factors are pushing two-sided markets to the fore. For one thing, information technology is increasingly important to the economy. And in many IT businesses, success turns on satisfying multiple constituencies whose demand for multiple products is interdependent. Thus, key players such as Sony, IBM and Sun are relying on "platform" marketing strategies that turn on the success of attracting both developers and users of applications software.

Note, too, that other factors, ranging from the growing importance of intangible intellectual property to globalization, are accelerating the introduction of products in two-sided markets that have "winner-take-all" characteristics. And the unorthodox business strategies to adapt to such markets are attracting the attention of regulators. Indeed, the recent antitrust suits against Microsoft and Visa were directly related to marketing practices peculiar to two-sided markets.

Yet, while business school gurus have certainly analyzed individual two-sided markets and many of the concepts have spilled into common business parlance – these days, for example, magazines are more apt to brag about the demographics of their readership than total circulation or the quality of the editorial content – there has been little effort to generalize about their workings.

The complexity of operating in two-sided markets creates challenges for investors and managers, who face unfamiliar problems in identifying winning strategies. More important from the perspective of public policy, it challenges regulators to rethink the way they judge the health of competition. Indeed, it may force the most basic rethinking of antitrust policy since economists succeeded in shifting the focus of analysis from questions of fairness to questions of efficiency.

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THE NOT-SO-OBVIOUS ECONOMICS OF TWO-SIDED MARKETS

It's easier to find examples of two-sided markets than to generalize about them. But three characteristics do seem common to all.

There must be distinct classes of consumers demanding complementary goods. General Motors has very good reasons to be in both the truck and the car business – it's cheaper to make and market one if you make the other. But GM could exist, and perhaps even thrive, by making just cars or just trucks. Contrast GM with Morgan Stanley's Discover Financial Services. To persuade merchants to accept the Discover card (and pay fees with each transaction), Morgan Stanley must persuade consumers to carry and to use the Discover card.

The value of the service to consumers on one side of the market depends on the number and qualities of consumers on the other side. Nasdaq's services are more valuable to owners of Intel because the large number of potential buyers linked through Nasdaq's computer network increases the liquidity of the stock. Note that the proportions of buyers needed to achieve balance between sides may vary enormously with the market. Thus, in 1999, American Express introduced the Centurian "black card," whose appeal to its 4,000 holders turned on its utter exclusiveness.

The "network economies" associated with having more participants on both sides of the

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The price that maximizes profits in a two-sided market isn't so easily derived, since demand for the two complementary products must be balanced.

market could not be realized without an intermediary. Singles in search of mates can (and do) wander around public parks on sunny afternoons looking for that perfect someone. But putting an ad in Yahoo! Personals is surely a more efficient way to meet a like-minded member of the opposite sex.

Profit Maximization

While we're all aware that the behavior of modern corporations doesn't always follow the gospel according to Adam Smith, profit maximization figures in there somewhere. And economists long ago worked out the simple conditions – simple in concept, anyway – that lead to maximum profit.

Sellers maximize the difference between revenues and costs by setting prices where the cost of marketing one more unit equals the net gain in revenue from its sale. For competitive firms, that net gain will equal the price. Hence, the hoary marginal-cost-equals-marginal-revenue condition for profit maximization implies that price will equal cost. For monopolists, selling more units means selling each unit at a bit lower price, and thus profit maximization implies price above cost. Hence, the classic result that monopoly breeds inefficiency by restricting output.

But the price that maximizes profits in a two-sided market isn't so easily derived since demand for the complementary products must be balanced. Changing the entry price for women at a singles club will change the number of women who show up, and thus the price that men are willing to pay to join the fun. Changing the subscription price of a magazine will change the number of readers (and perhaps their demographics), and will thus affect the demand for advertising space. Indeed, looking at demand and cost on one side of a two-sided market alone can't tell you what you need to know to maximize profit.

Entry Costs and Balancing Demand

For a lucky few businesses, the right products and the right marketing strategy yield profits from Day 1. But for most, start-up losses are to be expected. In fact, it is widely understood that most small businesses fail for lack of "working capital" before they get a chance to find out whether the business is viable.

Likewise, one could imagine a business in a two-sided market that became profitable very quickly. But, other things equal, there are reasons to expect that the start-up costs will be exceptionally high. Indeed, about the best face you can put on the dot-com's apparent indifference to profitability was the implicit assumption that, in a two-sided market enterprise, the start-up period would be exceptionally long and thus profits would be a poor benchmark of success early on. Hey, if that reasoning is good enough for Condé-Nast's *Teen Vogue*, why not use it to rationalize the burn rate for Loadabull.com?

In a one-sided market, establishing the viability of a product is relatively simple: will sufficient numbers of consumers buy the product at a price above cost? In a two-sided

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market, the question must be answered on both sides – and simultaneously. Moreover, more experimentation in pricing may be needed to arrive at the answer because the experience of others may not serve as a benchmark. In magazines, for example, the range of successful periodicals runs the gamut from an all-subscription revenue model (*Consumer Reports*) to an all-advertising revenue model (Harte-Hanks's local *PennySaver* shoppers) to everything in between.

It may even make sense to charge what amounts to a negative price to one side of the market. Microsoft spends hundreds of millions of dollars each year providing free or cut-rate services to software developers to encourage them to create applications for Windows. The software giant is compensated indirectly, through the sales of Windows to users who value access to diverse applications software as well as through sales of its own software applications (like Microsoft Office) to consumers lured to the Windows platform by the software cornucopia.

By the same token, it is likely that American Express spends more to provide ancillary services, like frequent flier miles and collision-damage waivers on car rentals, than it earns in annual fees from cardholders. But these net outlays are probably more than offset by the fees that merchants pay when the cards are used. All told, four-fifths of the revenue from Amex cards comes from merchant fees.

One factor driving the way costs are apportioned is the degree to which users are locked into a single intermediary. With computer operating systems and video games, users are reluctant to change platforms, but software developers often write applications for more than one platform. With payment cards, by contrast, many people carry both American Express and one or more of the bank association cards.

Just how such "multihoming" affects prices can be quite complicated. For example, manufacturers of video game platforms heavily subsidize sales of the console in an effort to lock in players – the hardware in a PlayStation2 or an Xbox rivals that in full-blown PCs costing several times as much. The profit from sales of the platform makers' own games, as well as royalties from licensing other gamemakers, presumably depends on both the installed base of consoles and the popularity of the individual games.

Note, too, that the pricing problems of companies in two-sided markets may be compounded by network economies within each side. Thus, new magazines often "buy circulation" – offer subscriptions for little or nothing – in order to create interest among readers as well as to make the publication more attractive to advertisers. And they may offer space for little or nothing to high-profile advertisers in order to make the publication appear to be a safe bet for other advertisers.

THE CHALLENGE FOR REGULATION

For a host of reasons, companies operating in two-sided markets are likely to attract the attention of competition authorities. Start with the reality that two-sided markets are likely to be more concentrated than one-sided markets. Two-sided markets invariably exhibit network effects that increase the size at which a company will be most efficient. The more people who buy and sell on eBay, the more it is valued by buyers and sellers. Hence, it should not be terribly surprising that roughly 85 percent of all Web-based auction revenues go to eBay.

For reasons noted earlier, it is also typically quite expensive to establish a viable company in a two-sided market. As a practical matter, that daunting capital requirement makes

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For a host of reasons, companies operating in two-sided markets are likely to attract the attention of competition authorities.

challenges to incumbent firms less likely. Microsoft has fought battles with Apple, IBM and now Linux for king of the mountain in operating systems over the last decade. But compared with, say, the automobile industry, hard-fought skirmishes for market share in operating systems are relatively rare.

Moreover, the higher cost of establishing a foothold in a two-sided market and the higher risk that the enterprise will fail implies that a firm must expect to earn high profits if it does succeed. *Sports Illustrated*, for example, lost money for many years before it became a cash cow for what is now AOL Time Warner. So it should not be surprising that the operating profits of the enterprises that do prosper in two-sided markets are relatively high.

Last but hardly least, no matter how competitive, costs and prices aren't likely to track the separate sides of a two-sided market. And since it is common for one side of the market to bear much of the cost, it is also likely that the price charged one side of the market will be far higher than the costs directly attributable to services to that side of the market. Thus, the fees that American Express demands from merchants exceed the costs of processing transactions, carrying the float and bearing the burden of card fraud.

This creates a considerable challenge for antitrust regulators to distinguish between actions that would undermine competition in one-sided markets, yet serve the long-term interests of consumers in two-sided markets.

For example, concentration in markets is widely viewed as a warning that competition isn't working. Indeed, the Justice Department's merger guidelines include a calculation of a merger's potential impact on a standard index of industrial concentration. While opposition to mergers that would raise the index above a threshold is not automatic, it certainly can change the burden of proof.

By the same token, the guidelines discourage mergers in which the merged firm could raise prices significantly – 10 percent is the rule of thumb. Yet one could certainly imagine a merger in a two-sided market in which the combined firms found it profitable to raise prices substantially on one side and lower them on the other. What ought to count, then, is whether the sum of the prices charged by the merged firm to the two sides of the market could be substantially higher.

Note, too, that the trustbusters use industrial concentration as evidence of monopoly power. While it is not illegal to possess a monopoly, the tactics a firm with monopoly power may use in countering the efforts of rivals are far more constrained than that of a non-monopolist.

The Microsoft case illustrates the pitfalls in applying tests devised to weigh the health of one-sided markets to a two-sided market. The Justice Department argued that Microsoft's PC operating system monopoly was protected by an "applications barrier to entry." Other operating systems could not hope to compete, the government said, because they could not hope to match the quality and diversity of

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software applications that ran on Windows.

Seen from the perspective of two-sided markets, however, the applications barrier to entry was the benign consequence of Microsoft's strategy of charging less to one side of the market – in this case, actually subsidizing production of applications software – in order to add value to the other side. In itself, this barrier to entry seems no more artificial or threatening to society's interests than the fact that GE's multibillion dollar investment in jet engine technology would make it very expensive and very risky to start another aircraft engine company.

The government also charged Microsoft with predatory behavior against Netscape's Navigator Web browser. To drive Navigator out of business and monopolize browsers, the government said, Microsoft gave away valuable software tools that made it possible for Internet service providers and corporate information technology departments to customize the Internet Explorer browser. But what looks damning in the context of a one-sided market has an innocent interpretation in a two-sided market: encouraging Internet service providers to use Internet Explorer on one side of the market made Windows more valuable to users on the other side.

The issue of how companies in two-sided markets get and keep both sides on board has touched competition policy in other ways, too. Some two-sided markets have room for dozens or even hundreds of efficient-size competitors; they solve the problem of achieving network efficiencies by creating cooperatives that deliver the network service.

Thus, relatively small competing real estate brokers collectively maintain the Multiple Listing Service, which allows members to exploit the efficiencies of a larger inventory on the seller side and increases the number of potential buyers for each. And banks, which are too small to achieve network economies by issuing their own payment cards and signing up merchants to accept the cards, have formed the MasterCard and Visa associations. The payment card cooperatives operate the electronic transactions networks and exploit other marketing activities – advertising, branding, creation of new services – that can reduce costs per transaction.

The payment card associations also, in effect, set a floor on the fees that all banks charge to merchants accepting the cards – a practice that has, not surprisingly, caught the eye of competition enforcers in many countries. Visa's collectively set "interchange fee" – a fee paid to card-issuing banks by the banks that processed the transaction – was challenged in a private antitrust suit in 1979. The federal courts ruled in Visa's favor, deferring to Visa's argument that the revenue from the interchange fee was needed to offset the costs of issuing enough cards to balance the market.

Australia's central bank, which regulates the Australian card payments system, recently reached the opposite conclusion.

The Royal Bank of Australia implicitly accepted the idea that charges on each side of a two-sided market need not match the narrowly defined costs of servicing that side. And it did not allege that the revenues were generating excessive profit for the banks, which, like their American counterparts, competed away much of the revenue bonanza by offering extra goodies (like frequent flier miles) to cardholders. But it did decide that the charges were too high in the sense that they encouraged overuse of cards compared with cash and checks.

In justifying their decision, the Australian regulators alluded to a plausible economic model showing the interchange fee that balanced the two sides of the card market could

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exceed the fee that equalized costs among various methods of payment. But the same economic model also suggested it was possible that, in the process of balancing the two sides of the card market, the payment card associations would set the interchange fee below the optimal level.

In other words, regulators could show that the private market outcome was not necessarily efficient, but they couldn't show that government could necessarily do better. Just why the Royal Bank of Australia decided to tilt in one direction instead of the other is unknown. But it is known that the issue was initially raised by the retailers' trade association, which chafed at the fees charged by the card payment companies. And there is a vast body of literature in economics suggesting that, eventually, regulators are captured by one competing constituency or another – a reality of democratic pluralism, perhaps, but hardly a comforting reality.

Efforts to regulate collusive behavior in two-sided markets highlight another irony. The bank card associations' collective pricing on one side of the market was bound to attract the attention of regulators. But American Express, which operates a payments system of the same order of magnitude, is far less subject to scrutiny.

The card-issuing side of the payments market is fiercely competitive, with dozens of huge players and thousands of smaller ones competing with a half-dozen card brands. Would competition be healthier if, say, only five integrated payment card companies, like American Express, controlled both sides of the market?

More generally, two-sided markets are likely to encourage novel partnership arrangements among competitors – collective behavior that might reduce competition or, as in the case of the card associations, increase

Two-sided markets are likely to encourage novel partnership arrangements among competitors.

competition on one side of the market while arguably reducing it on the other. Computer operating system designers collaborate with microprocessor designers, affecting competition in the computing platform market. Real estate brokers collectively devise the rules for the Multiple Listing Service, affecting competition in a variety of ways.

The question for the regulator of a two-sided market is thus twofold. Is the restraint of competition in portions of a multisided market justified on grounds of efficiency? And if the answer is problematic – as the Australians might have concluded – is regulation in the context of interest group pressure work better than no regulation?

Stylized models of markets are just that – models that are no better than the underlying assumptions. And while the standard one-sided market model has offered powerful insights into capitalist economies, its weaknesses in analyzing contemporary markets are increasingly apparent. That, of course, is ominous news for managers who understand the world is changing, yet lack a rudder to negotiate the treacherous waters. It is equally problematic for regulators, who are likely to find that healthy competition in a world of markets riddled with interdependencies is increasingly difficult to define. M

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Stock Market Bubbles

When does intervention work?

by Frederic S. Mishkin and Eugene N. White

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In recent years monetary policymakers have worried about asset price bubbles – in particular, what they should do about them. The stock market collapse in Japan in the early 1990s has been followed by a decade of stagnation. And in his famous 1996 speech, Alan Greenspan raised the possibility that the United States stock market was putting the economy at similar risk in its display of "irrational exuberance."

SIPA

Whether or not irrational exuberance is a threat, it's widely agreed that stock market crashes reduce aggregate demand. The shock (a) reduces wealth and thus consumer spending and (b) raises the cost of capital and thus reduces real investment. Because stock price movements have an important impact on economic activity, central banks have strong incentives to respond to them. It is unclear, however, whether they should react to stock market fluctuations over and above the reaction suggested by their effect on demand through the standard transmission mechanisms.

For example, some analysts argue that central banks should at times react to stock prices in order to stop bubbles from getting out of hand. Alternatively, the monetary authorities might be inclined to try to prop up the stock market after a crash by pursuing a more expansionary policy than the one indicated by the straightforward effects on consumption and investment. Such strategies might be appropriate if stock market crashes produce additional stress on the economy by destabilizing the financial system.

THE CRASHES AND THEIR AFTERMATH

The stress on the financial system from a crash should become visible in "risk premiums" on interest rates. Indeed, a key sign of financial instability is a large rise in interest rates for borrowers whose credit is called into question by falling asset prices. One would expect a smaller effect on interest rates for borrowers whose credit is widely understood to be solid. Consequently, a crash that produces financial instability should lead to a rise in interest-rate spreads between high quality bonds and those with lesser credit ratings.

To see whether stock market crashes are associated with financial instability, we looked at all crashes in the 20th century, examining what happened to interest-rate spreads and real economic activity.

Whether a stock market crash will have a distinct and severe effect on the credit terms for higher risk borrowers (thereby transmitting

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an independent shock to the economy) seems to depend on two factors. First, the condition of the financial system just before the crash: if the system is weak – if it is highly leveraged or has experienced cumulative shocks – it is more likely that a crash will induce lenders to raise interest-rate spreads and produce financial instability.

Second, if a shock transmitted from the stock crash does promote financial instability, the central bank's reaction is critical. It can ignore the shock, in which case interest-rate spreads will rise sharply. Or it can inject liquidity into the system and dampen the effects. Note, too, that the more rapid and violent the crash, the more likely it will be a surprise – and thus give lenders less time to make adjustments other than altering credit terms.

On the face of it, defining a stock market collapse seems simple: when you see it, you know it. A precise definition is more difficult. To screen for the biggest stock market declines, we examined the behavior of three well-known stock indexes: the Dow Jones Industrial Average, the Standard & Poor's 500 (and its predecessor, the Cowles index) and the Nasdaq composite index.

As October 1929 and October 1987 are universally agreed to be crashes, we used them as benchmarks. On Oct. 28 and 29, 1929, the Dow declined 12.8 and 11.7 percent; on Oct. 19, 1987, it fell 22.6 percent. We thus define a crash as a 20 percent drop in the market.

The size of the decline is, however, only one characteristic of a crash; speed is another. Therefore, we look at declines over windows of one day, five days, one month, three months and one year. To cast a net that captures both speed and depth, we sorted the percentage changes for each window and looked at the 50 largest declines. Our screening procedure identified 15 major stock market crashes in the 20th century.

The 15 crashes fit into four categories.

1. Episodes in which the stock decline did not appear to stress the financial system because interest-rate spreads did not widen appreciably. These included the crashes of 1903, 1940, 1946, 1962 and 2000.
2. Episodes in which the crashes were extremely sharp and did put stress on the financial system, but where there was subsequently little widening of spreads because the Federal Reserve intervened. These were the crashes of 1929 and 1987.
3. Episodes in which the crashes were associated with large increases in interest-rate spreads, suggesting severe financial distress. These include the crashes of 1907, 1930-33, 1937 and 1973-74.
4. Episodes in which the crashes were associated with increases in spreads that were not as large as in the third category, suggesting some financial distress. These were the crashes of 1917, 1920, 1969-70 and 1990.

What conclusions can we draw? First, the fact that crashes in Category 1 are not accompanied by increases in spreads implies that drastic stock declines need not produce financial instability. These are cases in which both corporate balance sheets and the financial system were in good shape before the onset of the crash – and in which the accompanying economic downturns tended to be fairly mild. Second, very sharp stock market crashes like those in 1929 and 1987 (Category 2) do have the potential to disrupt financial markets. But actions by the central bank to prevent the crashes from seizing up markets – as distinct from actions designed to prop up

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stock prices – can prevent system-wide instability. Third, situations in which financial instability becomes severe (Category 3 cases, where spreads widen substantially) are associated with the worst economic downturns.

Because market crashes are often not followed by financial instability, we should be cautious about assigning causality from timing evidence. Certainly, one cannot make the case that crashes are always the main cause of financial instability.

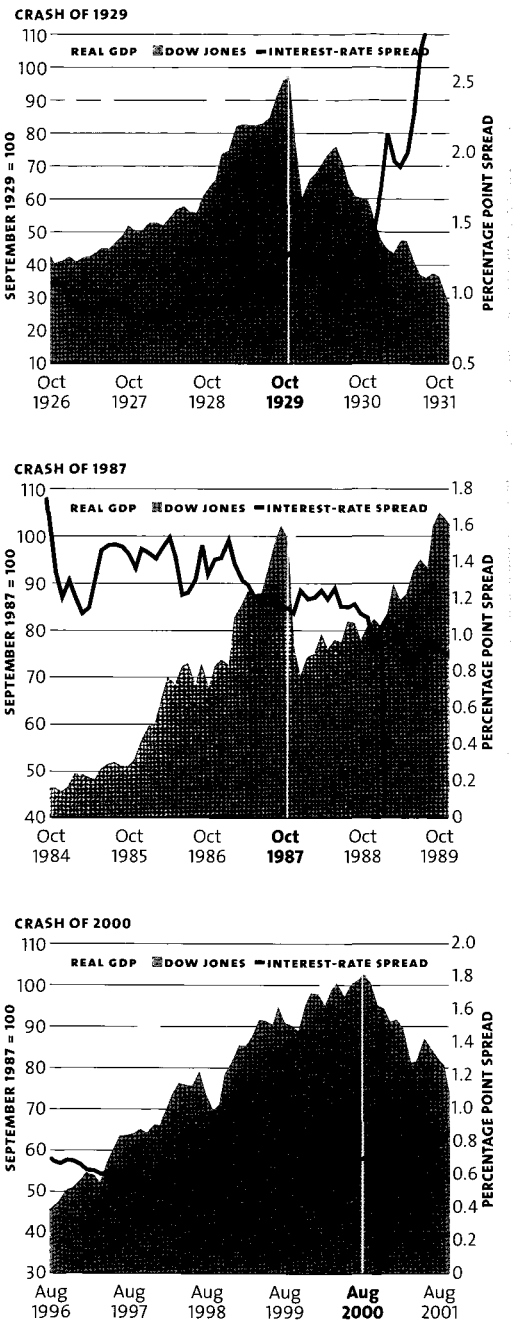
Indeed, in many episodes financial instability may have been caused by independent factors, such as the collapse of the banking system or the severity of the economic contraction. Only in the case of the extremely sharp market crashes, as in 1929 and 1987, do we have more direct evidence that some financial markets were unable to function as a direct result of the crash. Thus in most cases, the impact of a stock market crash will largely turn on the conditions of corporate balance sheets before the decline.

IMPLICATIONS FOR MONETARY POLICY

What, then, are the implications for monetary policy? Financial instability – not the stock market crash in itself – is the key challenge facing policymakers, even if the decline reflects the bursting of an asset price bubble. If the balance sheets of financial and non-financial institutions are initially strong, a market crash is unlikely to lead to systemic instability. In this case, the decline of stock prices will affect real output through the usual channels of wealth and cost of capital, only requiring the monetary policymakers to respond directly to the decline in aggregate demand.

However, central banks may see the need to respond directly to a crash when asset price declines put stress on the financial system. That is just what the Fed did in 1929 and 1987, when it had good reason to believe that

STOCK MARKET CRASHES AND FINANCIAL INSTABILITY



NOTE: Interest-rate spread is the difference between the interest rates on Moody's Aaa and Baa corporate bonds.

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The Big Ones

The great crashes of 1929 and 1987 make an important pairing. The pattern of the crashes was similar, as was the Federal Reserve's successful lender-of-last-resort intervention to prevent the effects of a crash from spilling into the rest of the financial system. The Fed's subsequent responses, however, were very different.

1929

On the two days Oct. 28-29, the Dow fell a total of 24 percent. All told, the DJIA was down 19.6 percent for the month and fell another 22 percent in November. Although there was a brief recovery early in 1930, the market fell almost continuously for the next two years – producing the deepest long-term market decline by any measure.

The behavior of the interest-rate spread is puzzling at first glance: it increases as the market moved upward in late 1928 and 1929, then fell along with stock prices. Only from mid-1930 on do spreads soar off the chart.

This pattern can largely be explained by Fed actions. The Fed tightened credit in early 1928 and tightened it further in February 1929 in response to soaring stock prices, instructing banks to limit loans to brokers. Finally, it raised the discount rate in August 1929. Fed pressure did not suppress the demand for credit to buy stock, which was supplied by other intermediaries.

Nevertheless, the market did extract a premium on brokers' loans, reflecting lenders' concerns that the rise in the market was not sustainable. Volume in the market for short-term business debt fell by half, while the issuance of foreign bonds virtually terminated.

When the market collapsed in October, lenders in New York rushed to liquidate their loans to brokers. To keep the loan market from freezing solid, the Federal Reserve Bank of New York engaged in a classic lender-of-last-resort operation; in addition, it purchased some $160 million in bonds in "open market" operations. As a result, there were no panic increases in money market rates or threats to banks from defaults on brokers' loans, and the interest-rate spread declined.

Unfortunately, the Federal Reserve Board in Washington did not approve of the New York Fed's intervention. It censured the New York bank and, in spite of the recession that had begun during the summer, it maintained a tight monetary policy. The tentative recovery in 1930 was aborted and numerous bank panics followed. The continued decline in stock prices through early 1933 and the rise in the interest-rate spread reflected the economy's Fed-aggravated slide into depression.

The collapsing economy placed enormous stress on the banking system, and the subsequent banking crises magnified the economic decline. Risk premiums soared, as lenders fled from risky borrowers.

The 1929 collapse shows the importance of the two factors we have identified in high relief. The banking system was relatively weak and the drop in the market was large and sudden. However, the effects were quickly contained by the response of the New York Fed. Yet the less sudden decline in asset values in the 1930s led to rising risk premiums on loans because the Fed stuck to tight money.

1987

On Oct. 19, the Dow fell 22.6 percent, the

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largest one-day decline ever. Thus, the pattern of the rise and fall of the market for 1926-1929 and 1984-1987 look remarkably similar.

Unlike the case in the 1920s, the Fed in the 1980s was not preoccupied by speculation. But it was concerned about inflation and tightened policy to prevent any acceleration. At the outset of the stock market boom, the money supply (however defined) had increased at a fairly rapid pace. But in the first six months of 1987, its growth slowed considerably. Money markets, worried about rising foreign interest rates, trade deficits and a weak dollar, drove up interest rates in the United States in anticipation of the Fed's likely response. But the economy continued to grow, and the interest-rate spread declined even as the market moved into the last phase of the boom.

The sharp decline on Oct. 19 put the financial system under great stress because brokers needed to extend huge amounts of credit to their customers to meet margin calls. Kidder Peabody and Goldman Sachs alone advanced $1.5 billion in response to margin calls on their customers by noon of Oct. 20. Despite the financial strength of the leading firms, there was so much uncertainty that banks were reluctant to lend at a time when credit was most needed.

To prevent a collapse of the brokerage firms and the settlement process itself, Alan Greenspan announced before the market opened on Oct. 20 that the Fed was ready "to serve as a source of liquidity to support the economic and financial system." The Fed bought $17 billion worth of bonds, adding liquidity equal to one-quarter of bank reserves. In addition, commercial banks were told that they were expected to continue to lend to broker-dealers to ensure that the brokers could afford to carry their inventories of securities. Spreads widened at the outset of the crisis, but quickly decreased in response to the Fed's actions. As financial markets calmed, the Fed carefully withdrew most of the extra bank reserves, keeping overnight loan rates about one percentage point below the pre-crash level.

Thus, the crash did not threaten the stability of the financial system despite the large loss in equity values. Bank failures and loan losses were rising rapidly in the late 1980s, yet the crash did not damage the vulnerable financial system. The Fed's lender-of-last-resort operation was as successful as in 1929. But this time, subsequent monetary policy focused on financial stability – not on the stock market.

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The Latest One

The current bear market began in August 2000, with the S&P 500 falling 23 percent by December 2001. (The Nasdaq began to fall 5 months earlier). The collapse mirrored the slowing economy, which slid into recession in March 2001. However, it is important to note that the collapse in stock prices was not evenly felt across the market. Between August 2000 and December 2001 the Dow dropped approximately 11 percent, the S&P 500 fell 23 percent, and the Nasdaq nearly 49 percent.

Higher-tech, higher-risk stocks took a beating. Yet, this did not immediately translate into higher risk premiums for borrowers and hence a higher interest-rate spread, even in the aftermath of Sept. 11. One explanation is that the financial system was stronger than at any time since the 1960s. Weak banks had been culled through failure and merger, while new regulations and a long period of growth had made banks less susceptible to a sudden decline in asset values. Thus, there was no reason for a squeeze on less creditworthy customers, despite the decline in the stock market.

There was a sharp increase in the interest-rate spread in December 2001, which continued into 2002. But this development reflected the Enron scandal – not the decline in stock prices. Revelations of fraud and misleading accounting made clear that the quality of information about corporations was poorer than the markets had supposed. It thus is not surprising that lenders became more cautious.

financial markets would otherwise be unable to function. In both episodes much turned on the nature of the stress. The degree of trauma had more to do with the speed of the stock market decline than the overall percentage drop – which has at times been far larger, yet had little impact on the financial system. Furthermore, in neither episode did the Fed try to prop up stock prices. The goal was to make sure that the financial markets would function normally.

This focus implies that central banks should respond to disruptions in the financial markets even if the stock market is not a major concern. For example, the Fed responded aggressively to prevent a financial crisis after the Penn Central Railroad bankruptcy in June 1970 without much concern for developments in the stock market, even though the market had fallen substantially from its peak in late 1968.

In the aftermath of the Penn Central bankruptcy, the commercial paper market – the market for short-term corporate debt securities – stopped functioning, and the Fed stepped in as a lender of last resort. The New York Fed contacted key money-center banks, encouraged them to lend to customers who were unable to roll over their commercial paper and made clear that Fed credit would

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be available so that banks would have adequate resources to make these loans. The banks followed the Fed's "suggestion," borrowing $575 million for this purpose. In addition, the Fed, along with the Federal Deposit Insurance Corporation and the Federal Home Loan Banks, decided to suspend interest rate ceilings on deposits of $100,000 or more in order to attract cash to money markets. And the Fed also indirectly supplied liquidity to the banks by purchasing bonds in the open market.

Similarly, in the fall of 1998, the Fed flooded the system with money, lowering the rate banks charge each other on overnight loans needed to meet reserve requirements by three-quarters of a percentage point, even though stocks were trading at levels considered to be high by Federal Reserve officials. The Fed's intervention stemmed from concern about the collapse of the ruble and the failure of Long-Term Capital Management.

A spectacular lender-of-last resort operation was also carried out in the aftermath of the destruction of the World Trade Center on Sept. 11, 2001. Because of the disruption to the payments system, the cash needs of the financial system skyrocketed. To satisfy these needs and so protect the financial system from gridlock, the Fed acted as it had in the 1987 stock crash. It made an unusual public announcement, reminding the world that the "Federal Reserve System is open and operating. The discount window is available to meet liquidity needs." The Fed then proceeded to lend $45 billion to banks – a 200-fold increase over the previous week. As a result of this action, along with the decision to pump some $80 billion of reserves into the banking system through open market purchases of government bonds, the financial system kept functioning. When the stock market reopened on Monday, Sept. 17, trading was orderly – although the Dow did decline.

These examples suggest the importance of focusing on the potential for financial instability. Excessive focus on the stock market might have led central banks to fail to take appropriate actions as in 1970, 1998 and 2001, when the stock market was not a primary concern.

The ideal response to a change in asset prices very much depends on the source of the shock and its duration.

Too great a focus on the stock market presents other dangers. Attention to asset prices – in this case, the price of publicly traded stocks – can lead to the wrong policy responses. The ideal response to a change in asset prices very much depends on the source of the shock and its duration.

Consider the decisions by Chile and New Zealand to tighten monetary policy in response to the downward pressure on the exchange rates of their currencies in the aftermath of the East Asian and Russian financial crises in 1997 and 1998. Since the shock effectively raised the price of imports and lowered the value of exports for both countries, it would have been better met by an easing of monetary policy. Not everyone made the mistake: the Reserve Bank of Australia eased monetary policy after the collapse of the Thai baht in July 1997 because the bank rightly focused on inflation control rather than the exchange

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rate. The excellent performance of the Australian economy compared with the performances of New Zealand and Chile during this period illustrates the benefit of keeping eyes fixed on primary objectives rather than on asset prices.

A second problem with focusing on stock prices is that it raises the possibility that the central bank will be made to look foolish. The linkage between monetary policy and stock prices is weak. Most fluctuations in stock prices occur for reasons unrelated to monetary policy, either reflecting economic fundamentals like corporate earnings or what Keynes dubbed "animal spirits." The capacity of central banks to control stock prices is thus very limited. Hence, if the central bank indicates that it wants stock prices movements to change in one direction and the opposite occurs, it will look inept. Recall that Alan Greenspan made his irrational exuberance speech in 1996, when the Dow was around 6,500. This didn't stop the market from climbing above 11,000.

A third pitfall in focusing on stock prices is that it may weaken political support for the central bank because it leaves the impression that the bank is meddling where it doesn't belong. Part of the reason central banks have been successful in recent years is that they have narrowed their focus and have more actively communicated what they can or will do.

Specifically, central banks have argued that they are less capable of managing the short-run business cycle and should therefore focus more on long-term price stability. This communication strategy has been a very successful part of "inflation targeting," a monetary regime that has been gaining in popularity in recent years. Moreover, by narrowing their focus, central banks have been able to increase support for their independence. Extending attention to asset prices could cause the public to worry the central bank is exercising undue influence.

A fourth problem with focusing on the stock market is that it may create what economists call "moral hazard." Knowing that the central bank is likely to prop up the stock market if it crashes, market participants may be more likely to bid up prices. Hence, central bank interest may feed excessive valuation of stocks and make a bubble more likely.

This begs the question of whether monetary authorities should try to prick asset price bubbles. After all, subsequent collapses can be highly damaging to the real economy – think of Japan. Some analysts argue that central banks should, indeed, react to asset prices in order to prevent bubbles from inflating. However, we see serious flaws in this argument.

It is important to recognize that it is very hard for monetary authorities to determine if a bubble has actually developed. To assume that they can is to assume that the central bankers have better information and predictive ability than the private sector. Yet the view that government officials know better than the markets has been proved wrong over and over again.

BOTTOM LINE

The key problem facing monetary policymakers is not stock market bubbles, but financial instability – which may or may accompany market crashes. Indeed, the 2000-2001 crash had little impact on interest-rate spreads and apparently did not lead to financial instability. Thus, the current environment is not one that requires a broad response to the stock market bust. By focusing on financial stability rather than stock prices, central banks are both more likely to manage their core task well and to maintain political support for their independence. M

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Management Fads

ILLUSTRATIONS
BY RANDALL ENOS

Rich Miniter and Stan Liebowitz come from very different places: Miniter is a former editor for the European edition of the *Wall Street Journal*, while Liebowitz plies the academic economist's trade at the University of Texas in Dallas. But they do share an enthusiasm for debunking received wisdom. ¶ In *The Myth of Market Share* (Crown), Miniter attacks the bigger-is-better syndrome that has proved the undoing of countless established businesses. Even the successful giants, he suggests, could be more successful if they focused on profits rather than size. In *Re-thinking the Networked Economy* (Amacom), Liebowitz offers a telling post-mortem on those crash-and-burn dot-com strategies. Most notably, he pounds nails in the coffin containing the "first-mover" advantages that were supposed to ensure immortality for the stars of the Internet boom. ¶ These guys don't take prisoners – but, hey, that's half the fun in reading them. — *Peter Passell*

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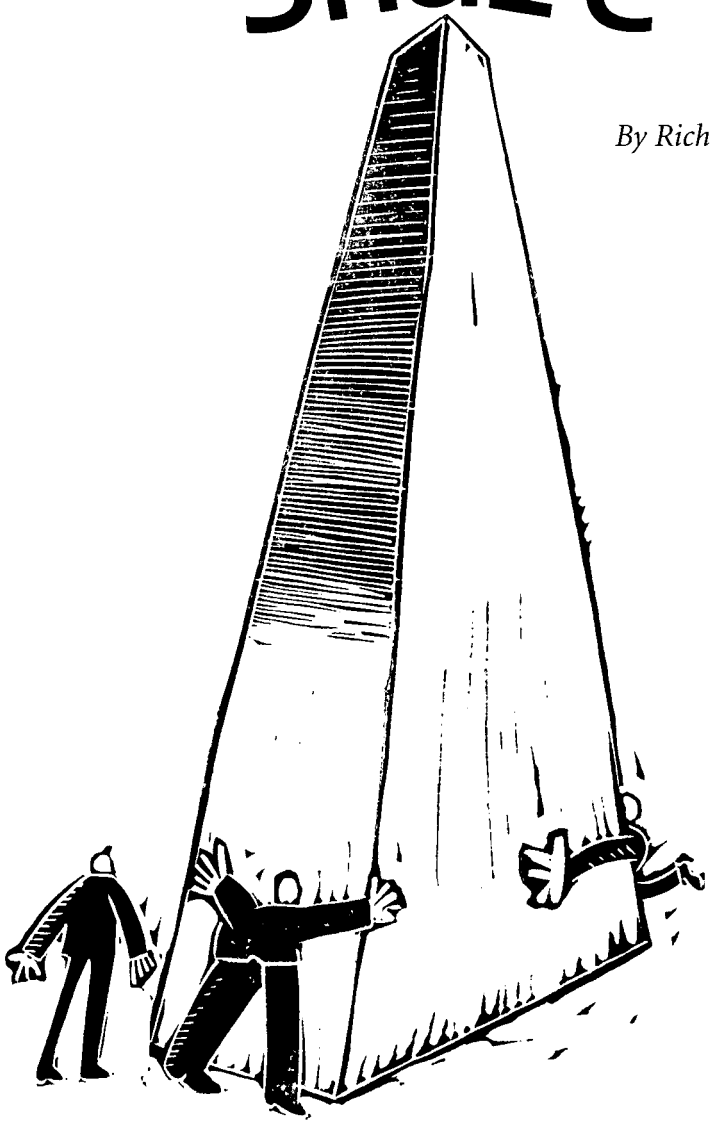
The Myth of Market Share

By Rich Miniter



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Business leaders are gripped by the cult of size. They are mad for market share. Keeping it, growing it, justifying it – try to talk to a senior executive without the subject coming up. "I can't predict the economy," Scott McNealy, the legendary chief executive of Sun Microsystems, told *Barron's* recently, "but we will gain share."

The reason is no mystery: top executives know that they are measured by it, and they know that they measure their subordinates by it. Market share is also an obsession among Wall Street analysts, institutional investors, financial journalists, growth-minded entrepreneurs, high-flying consultants, self-styled gurus and almost everyone with a 401(k). It seems like a neat shorthand for understanding the value and growth potential of any stock or business plan. It is easy – and, too often, wrong.

Like all dogmatic beliefs, followers explain away the contrary evidence or simply ignore what they cannot explain. Periodically, a researcher will emerge with new evidence about market share and profits. Eyes weary from poring over earnings reports, the unwelcome prophet will say something like, "Market share is the fool's gold of business. It looks valuable and it takes a lot of hard work to get – but it is nearly worthless." And, like most prophets, he will be ignored.

Maybe the discouraged prophet will drop his yellow legal-size tablets on the ground, allowing us to read his notes: "The market-share obsession, based on flawed and outmoded theories, drags down corporate profits and pushes companies into costly moves. It makes companies bigger without making them more profitable." Sometimes it seems to coincide with profits; too often it does not.

THE CULT OF SIZE

Let's start by looking into the world that really matters – the realm of results. Consider the roll call of companies that achieved large shares of the market in their industry sectors. Far from being dominant firms, many were sold, were acquired in hostile takeovers or simply went bankrupt. And the rest? They remain ailing giants – respected behemoths whose executives mumble that Wall Street analysts don't understand their business or claim their sector is having a "cyclical downturn."

The following companies have only two things in common: they focused on market share and failed to earn as much money as their competitors.

Amazon.com is a Brobdingnagian straight out of Jonathan Swift's *Gulliver's Travels*, which it probably sells more of than any other bookstore in the world. It is easily the nation's largest online book purveyor and moves more volumes than almost all of its bricks-and-mortar rivals. One small problem: despite seven years of market-share growth, it didn't report a net profit until January 2002. Even that tiny $5 million profit would have disappeared if the euro hadn't declined against the dollar, reducing its euro-denominated debt by $16 million.

DEC once had a large share of the minicomputer business. But profits slipped, as market share remained firm. Digital, née

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DEC, was rescued by Compaq. Now Compaq itself is in trouble. But Compaq's CEO, Michael Capellas, told *Fortune* magazine that he will not make Digital's mistakes: "We will cede market share to protect profits." Mr. Capellas must have learned something since March 1996 when he stated that he would sacrifice profit to build market share. But, in the end, Compaq couldn't transform itself into a profit-centered company. Old habits die hard. By 2001, Compaq was desperate to be acquired by Hewlett-Packard, a merger effort that soon led to a nasty proxy battle.

Even today's most successful companies could be more profitable if they cared less about market share.

Wal-Mart is hugely profitable. But the company is focused on expanding into new markets – whether they are exceptionally profitable or not. As a result, Wal-Mart is less profitable than its two smaller competitors, Family Dollar and Dollar General, from which investors earned more on a rate-of-return basis.

3M, the maker of Scotch tape and Post-it notes, is gargantuan, a $15 billion business that towers over its competitors in nearly every product category. At least in size. Yet others earn more profit in many categories. "3M is a $25 billion business trapped inside a happy, fat $15 billion company," one consultant told me. 3M is too busy running after tomorrow's products to catch today's profits, too busy innovating to focus on selling and serving its customers. Less innovative rivals quickly move in, snatching sales that should have been 3M's. Innovation is good, but failing to fully exploit the profit potential of its new products in the name of market share hasn't helped 3M become the next GE.

IS BIGGER BETTER?

The more that one looks for evidence of big companies exploiting their market share and superior scale to earn outsize returns, the more one finds evidence to the contrary. Take the American banking sector. The biggest originator of home mortgages in the first half of 2000 was Chase Manhattan Mortgage. Was it the most profitable on a net earnings basis? Not by a long shot. That honor went to Washington Mutual, the fifth-biggest lender, which earned $452 million. Chase Manhattan Mortgage earned less than $123 million.

Why didn't Chase Manhattan do better? Bankers are fond of saying that the cost of servicing a $100,000 mortgage is equal to the cost of servicing a $200,000 mortgage. All other things equal, the bank that has the highest average loan size is the most profitable.

Chase's problem was its low average loan size: $120,000. In terms of average loan size, Chase ranked 39th nationwide. To generate high volume, it had to take on many smaller, relatively less profitable loans. So Chase was bringing in more volume, but with a lower return.

Market-share madness seems to grip every industry. When three European steel companies announced a three-way merger to form the world's largest steelmaker, I phoned a London-based Commerzbank steel industry analyst, Peter Dupont. He immediately summed up the foolish fascination with market share in that industry, "A touching sign of faith for the cult of size."

ARTICLES OF FAITH

Market share is treated like an article of religious faith. Virtually every study on market share simply assumes a direct connection between market-share growth and profitability. "Capturing a dominant share of a market is likely to mean enjoying the highest profits of any companies serving that market," explained Paul Bloom and Philip Kotler in a

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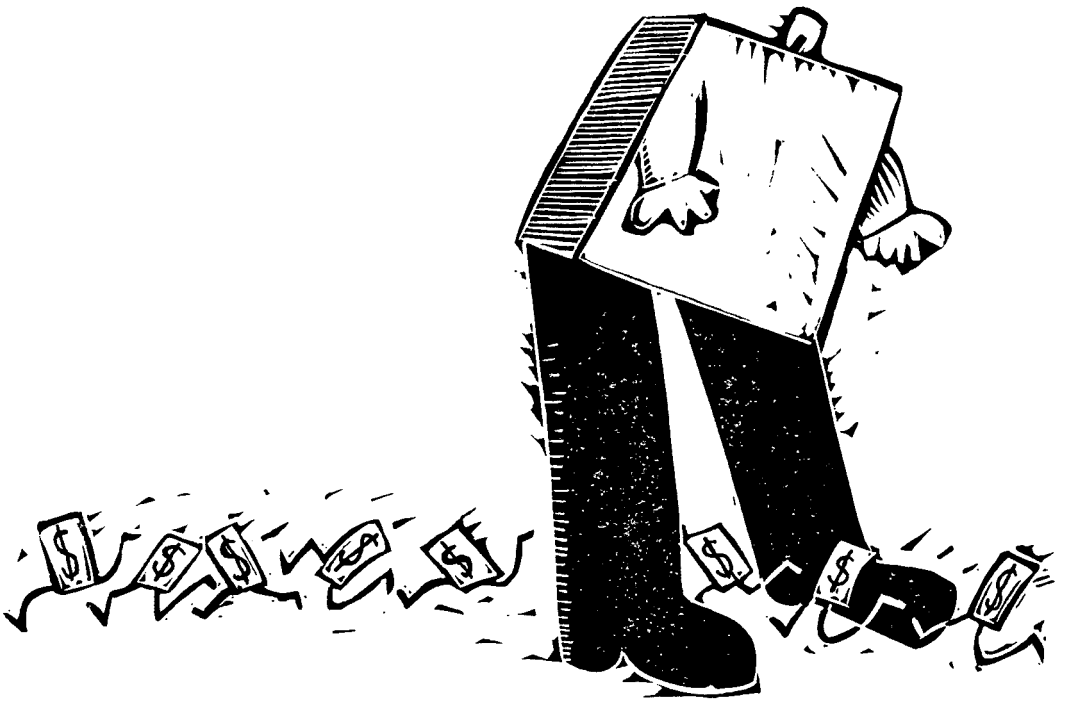

1975 *Harvard Business Review* article.

That sentiment appeared over and over again in dozens of major business journal articles in the past few decades and it was often the unstated assumption in hundreds more. Those studies became part of the curricula at business schools around the world and worked their way into the popular business press – everything from *BusinessWeek* and the *Wall Street Journal* to *Fortune* and *Business 2.0*.

Over the years, managers decided to listen to the "experts" – and those studies became the bricks in the foundation of thousands of business plans and corporate strategies. Soon nearly everyone believed that market-share growth meant higher profits.

Even widely respected experts were ignored when they said the wrong thing. Harold Demsetz, a professor emeritus at UCLA, noted, "Alternative explanations for this data generally were ignored because the market-concentration doctrine had won the imagination of investigators and given direction to their thoughts, much as Ptolemaic astronomy [the idea that the sun revolved around the earth] provided the signposts for the study of heavenly bodies the 400 years surrounding the life of Christ."

But what about the evidence to the contrary? What about the studies that tested the assumed correlation between market share and higher than average returns and found the dogma lacking? In 1982, Carolyn Y. Woo and Arnold C. Cooper of Purdue University published a powerful article in the *Harvard Business Review*, titled "The Surprising Case for Low Market Share." It detailed a number of companies that earned much higher returns than their much-larger competitors.

Their conclusion challenged the conventional wisdom with a wealth of evidence: "Low market share does not inevitably lead to low profitability. Despite the well-accepted correlation between market share and profitability, market share is not a necessary

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condition for profitability." But Woo and Cooper were challenging the consultant catechism, and the cult of size kept its believers.

Other researchers pointed out that the much-touted correlation between market share and profitability was in fact mistaking cause for effect. One study warned against accepting the idea that market share and profitability were linked. Instead, both are dependent on product quality, price, costs, distribution, marketing, strategic objectives and so on. Market share, rather than leading to profitability, was the result of successful business practices that also led to profitability.

Profits may be the result of "unobservable factors such as managerial skill and luck.... That is, market share may not strictly cause business success but rather be a consequence/outcome of it," noted another study. But these voices in the wilderness were soon forgotten. The conventional wisdom remained impervious to contrary evidence. Consultants had advice to sell, executives had plans to justify and entrepreneurs had dreams to chase.

The most thorough student of market share and profitability I've talked to is Donald V. Potter, president of Windermere Associates, a California-based consulting firm. He and his team examined 240 industries that have at least five competitors whose individual annual sales are each greater than $50 million. Among the top four firms in each of the industries, the market-share leader led the industry in pretax return on assets only 29 percent of the time – only 4 percentage points better than random chance.

Now look at the other end of the spectrum, the firms with the smallest market share among the top four in each line of business. Twenty-three percent of the time, these firms had higher returns than each of their three larger rivals did. If market share were an essential ingredient to above-average profitability, these relatively small fry should not even have been contenders. Instead, almost one out of every four times, they were the most profitable.

Dumb luck may be a better predictor of outsize profits in highly concentrated businesses than market share.

Some might think their industries are special. Highly concentrated, capital-intensive enterprises – everything from petroleum refineries to food processing conglomerates – still need scale and market share to be competitive, or so goes the theory.

Again, the Windermere evidence does not support this view. In highly concentrated industries, market leaders did only slightly better than average. They had the best industry returns only 38 percent of the time. Dumb luck may be a better predictor of outsize profits in highly concentrated businesses than market share.

Others say that high-growth sectors require market-share strategies. But, again, the facts tell a different story. High-growth industries actually did slightly worse than average, according to the Windermere study. Only 27 percent of high-market-share businesses in high-growth sectors had the best industry rate of return – compared with the average of 29 percent for all industries.

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Case Study: International Paper Co.

If market share were the path to riches and glory, International Paper Co. CEO John T. Dillon would be a happy man. His company is the world's largest paper producer. But so far, he is far from happy. For years, the paper maker faced a boom-and-bust cycle. When paper demand climbed, paper companies would flood the market with paper – often opening new plants to pump up the volume. Then supply would swell, prices would collapse and the paper industry would gasp for air. Some would fail; others would be sold. Then the survivors would start the cycle again.

Mr. Dillon vowed to break the grip of boom-bust by increasing market share. Here's how *BusinessWeek* described the strategy: "The way out of these lackluster results is to get bigger. With size comes greater market share and, it is hoped, some control over IP's prices."

By no coincidence, International Paper has been on a buying spree. Federal Paperboard was snapped up for $3.8 billion in March 1996. Then IP bought one of the largest makers of office printer and copier paper, Union Camp, for $7.1 billion in April 1999. Next, it acquired Champion Paper for $9.6 billion in June 2000. Total sales topped $28 billion in 2000, making IP bigger than many whole industries and the largest company in its own.

But size didn't translate into profits. Return on invested capital is roughly 7 percent – still significantly below that of rival paper makers, which are much smaller. Let's not lose sight of that return-on-capital figure; investors could easily earn a much better return in a run-of-the-mill mutual fund. And IP executives know that investors are starting to unfavorably compare the company's stock to savings accounts.

Returns to shareholders are "simply unacceptable," John Faraci, the company's chief financial officer, told shareholders in May 2001. In August, Faraci admitted to *Barron's* that IP "experienced only one year in the past decade in which returns exceeded the company's cost of capital."

International Paper's stock actually dropped in value during the late-1990s boom. Meanwhile, all of those acquisitions have left behind a debt hangover of $15.5 billion – roughly four times annual cash flow.

What about pricing power – surely all those acquisitions gave the company some ability to control prices? Not so far. Take a look at the magazine paper market, usually a very profitable niche. When IP bought Champion, it combined two large slices of the magazine paper market. It now holds a commanding share of the market – but prices are falling. Magazine publishers are demanding steep discounts, and the giant paper maker is giving them. By the end of 2001, IP was blaming the business cycle, the slowing economy and 9/11 for its weak performance. Everything but its misguided market-share strategy.

Part of the problem is that low-cost producers in Southeast Asia and Brazil rush in whenever International Paper tries to close down U.S. plants and raise prices. And International Paper simply can't shut them out. On the high end, Swedish and Finnish producers have higher productivity. No amount of market-share growth is going to change that, either. The only market that matters is the world market – and no paper company can ever become big enough to beat the entire world.

SECONDARY EFFECTS

The International Paper case tells us something else, too: the pursuit of market share can lead companies to make a series of questionable moves in the hopes of boosting share. In this case, it was a string of costly,

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ill-fated acquisitions.

But pursuit of market share, once market share is made the centerpiece of corporate strategy, can lead to other questionable moves. Executives and managers often find themselves "forced" to make a series of risky decisions – deep discounts, cheap financing and unprofitable or thinly profitable sales – just to defend or boost market share. These actions reduce profit margins, erode brand identity and harm the long-term health of companies. As long as companies spend on the market-share treadmill, profits seem further and further away.

Case Study: Izod Lacoste and the Anemic Alligator

René Lacoste, a 1930s French tennis champion, created the legendary Lacoste shirt. His distinctive crocodile emblem soon developed real cachet, fetching high prices and earning fat margins. The brand really took off after President Eisenhower was spotted wearing the trademark and a gaggle of golf-playing celebrities soon followed.

In the 1970s, Lacoste sold the U.S. rights to its polo shirt and emblem to General Mills, a Minneapolis-based conglomerate. Sticking to the high-price, high-margin strategy, General Mills had, by 1980, turned Lacoste shirts into a $400 million business in the United States. It peaked at $450 million in 1982.

Then the company began discounting to increase market share. Sales fell, triggering another round of price cuts and the use of inferior, synthetic fabrics to maintain margins. General Mills sold the crocodile to a sportswear marketer for $50 million in 1985 – about one-eighth of gross revenues of the brand just five years earlier.

The brand continued to flounder because the new owner followed a similar strategy: discounts, inferior materials and market-share madness. *Forbes* later dubbed it the "anemic alligator."

As the brand became synonymous with low prices and low quality, a buyer at Barney's, the trendy, upscale New York department store, had a now famous conversation with Ralph Lauren. Lauren's business was then mostly focused on up-market men's ties, but he was willing to listen. The Barney's representative wanted a high-quality, all-cotton replacement for the ailing alligator.

Forget about volume, the buyer said, just give us a shirt that can justify a high price. Soon Lauren's polo pony was trampling the alligator. Meanwhile, Lacoste, with its partner firm, Devanlay SA, bought back the U.S. license for $30 million in 1992 and, after a cooling-off period of several years, reintroduced the classic polo shirt with a "made in France" label. Its strategy is to charge more than the prices of its competitors, precisely to restore the brand's prestige.

Today sales are on the rise, and Saks Fifth Avenue is once again selling the shirts. But the French owner can never undo all of the harm of past market-share mistakes. As late as 2002, Ralph Lauren's Polo brand continues to earn the lion's share of profits in the high end of the $2.8 billion market.

THE INTERNET VERSUS MARKET SHARE

Now, more than ever, market-share strategies make little sense. Technological change is sweeping away many of the supposed advantages of volume. Even the economies of scale that often come with a large market share may not confer much benefit in the near future – the Internet allows smaller rivals to band together, win volume discounts and achieve "virtual scale."

Consider a joint venture between Honeywell and General Electric known as MyAircraft.com. MyAircraft.com is a Web site that

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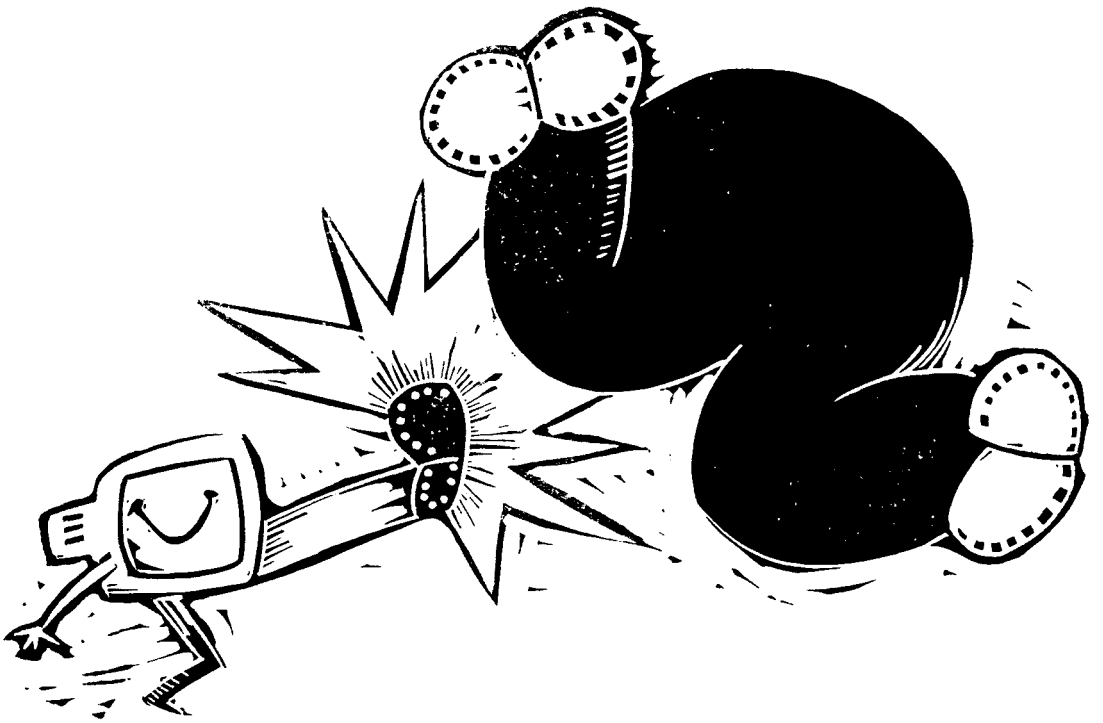

allows buyers to pool their orders. On MyAircraft.com, several buyers can set common technical specifications and bundle their orders together.

When a large number of orders are pooled, both the buyer and seller should benefit from economies of scale. Each can amortize their costs over a larger number of units, factories can run at full capacity with fewer changeovers and so on. Prices can be lower while margins stay roughly even. In theory and practice, everyone wins.

MyAircraft.com helps GE keep its aircraft engine factories busy, while its customers receive lower prices. Who loses? The aircraft-parts makers who counted on market share and a multitude of small orders to keep prices high.

But pooling orders also creates a kind of market power. Once the number of industrial buyers working together is large enough, the balance of negotiating power shifts to them. On Volumebuy.com and other sites, ordinary consumers can do the same thing. Want a discount on a cruise or a Palm Pilot? This Web site bundles thousands of buyers and wins volume discounts from manufacturers.

For managers, this situation poses two sets of questions. Executives ought to ask, "What would happen if our customers banded together?" In industries – everything from coal to bananas – where sales are driven primarily by price, collective purchasing could increase the pressure to slash prices and, eventually, costs.

But Web-based buyer's unions can demand more than just lower prices, especially in the B2B arena. Imagine a number of regional auto-parts retailers getting together to face down a large parts maker. After winning some price cuts, they might demand speedier deliveries, more integration between the store's inventory and the supplier's, a better return policy and so on.

Suddenly, selling to a heap of small fry can be like selling to General Motors. Now

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imagine this trend rippling across every business sector in the world.

Actual size is about to meet what I call "virtual size." Suddenly all of that hard-won market share can be had, by your rivals, with a few clicks of the mouse. Whatever the outcome, the assumed automatic benefits of size are going, going, gone.

Virtual size will upset the settled ways of the marketplace and rob "dominant" firms of their "rightful" place. Large corporations usually have three suppliers, at least in strategically important areas. There's the primary supplier – picture an industry giant with a well-known brand; a secondary supplier, an established player who is there in case the leader can't deliver in terms of quantity or quality; and a third supplier, perhaps an upstart, whose role is to put pricing pressure on the other two.

Now along comes a Web-based buyer's union to threaten the supplier hierarchy. Ordinarily, edging aside the established supplier wouldn't be worth the trouble for a big business. Why disturb a long-standing relationship for some temporary price savings? But when the cost savings produced by a buyer's union become big enough, corporate inertia dissolves.

Virtual size can steal away the power of market-share giants without taking on the corresponding costs of bulking up. Indeed, the smaller members of the buyer's union may benefit disproportionately. And the market-share giants will suffer disproportionately. Suddenly, actual market share does not look so attractive.

THE BIGGER-IS-BETTER MENTALITY

The appeal of market share is partly explained by corporate psychology. "They feel embarrassed pounding their chests and saying that their company is the most profitable. It's nicer to say that they have the most market share," says George Mason University economics professor Tom Rustici, "especially if they aren't that profitable."

Rustici knows something about turning the bigger is better mentality against itself. As the head of a pair of family-run supermarkets in Missouri, he got a call from a competitor one day. Would Rustici meet him at a nearby diner? Sure, he said, but he was surprised; the city's supermarket owners almost never talked to one another.

When he got there, the room was filled with local supermarket operators gathered around a table. They were scared. Wal-Mart was opening a giant store nearby and could seize almost half the market. Rustici was determined to keep his stores, but some talked about selling their family-owned stores. Others wondered aloud how long they could stay in business. "They are gonna cut prices to the bone," one said.

As he drove back to his main supermarket, Rustici began to develop a plan for beating the new giant. He called his staff together. He told them about the Wal-Mart and then said, "If I hear about any of you going to the new Wal-Mart – even on the weekend – you'll be fired immediately." Some employees tittered. They thought that Rustici was trying to stop them from shopping at the competition. But he had a larger goal: he didn't want them to go to the megastore and become afraid of its size; he wanted them to think about how to beat it.

For the next month, Rustici and his employees examined every price on every product in his stores. They negotiated discounts with their suppliers, where they could. They cleared the shelves of products that didn't sell well or didn't earn good margins. "We needed to make every inch of shelf space as profitable as possible," he said. He conducted

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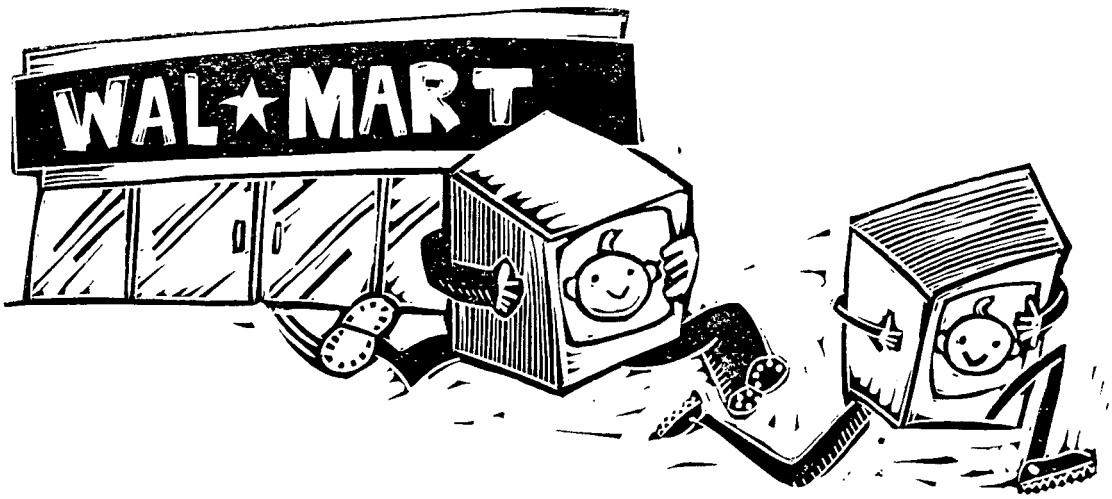

a top-to-bottom review of every aspect of the business. He pared costs and eliminated waste. He even changed the way his butcher cut the meat. He vowed to make his stores as efficient and competitive as possible.

Then, about a month later, the Wal-Mart supermarket opened. It soon developed a commanding market share, but Rustici's tiny, two-store chain held steady.

After another month, Rustici walked up to a stock boy and said, "Let's go for a ride." When they pulled into the Wal-Mart parking lot, the boy looked scared. "Don't worry. You're not getting fired," Rustici told him. "We're here to do a little market research."

Together, they wandered the aisles of the massive store. They looked at prices for leading items. Then Rustici noticed that baby formula was on sale – for a price lower than he could buy it from his supplier. This is where the power of large volumes and market share hit home. But he refused to give up. He picked up a case and asked the stock boy to grab another.

After they paid for the formula, they drove back to Rustici's store and put it on the shelf – at the regular price. Next, he phoned his distributor. It turned out that the distributor was also selling to Wal-Mart – at the same price that it was selling to him. "We can't even buy it from the factory that cheap," the distributor insisted. So Wal-Mart's supermarket had a classic loss leader, Rustici realized. He organized groups of employees to surreptitiously buy as many cases as they could. All were resold at Rustici's store at the usual price. His margins had never been so good.

Soon he began targeting other loss leaders. Although these bouts of guerrilla capitalism helped, paying attention to customers, improving efficiency and keeping prices competitive (without sacrificing margins) are what allowed Rustici to sustain his business in the face of a much-larger, better-financed competitor.

Within a few months, the Wal-Mart hypermarket closed. Apparently, the supermarket's low prices were attracting customers, but the loss leaders did not generate enough sales of other profitably priced products. "All you have to do is think about your customers and your profit margins," Rustici said, "and you can run circles around any large market-share business." M

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thinking THE Networked Economy

By Stan Liebowitz

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The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed, the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist.

– John Maynard Keynes

It is often asserted that being first is of paramount importance in the Internet age, far more important than it was (or is) is for bricks-and-mortar industries.

For example, Mary Meeker, the famous – now infamous – Morgan Stanley stock-market analyst closely associated with the dot-com stock run-ups, said in a 1997 report:

> Our Internet team thinks first-mover advantage for Web retailers may be important. The retail group, by contrast, doesn't think being first matters much, since barriers to entry will likely remain low on the Web.

What caused the Internet group to believe that first-mover-wins was an apt description of Internet retailing? What led them astray? Stock-market analysts usually do not create their own theories. They typically take ideas, right or wrong, from some academic thinker. And, indeed, the idea of first-mover-wins fits in neatly with a strain of economic thought that arose in the late 1980s and was proselytized to business audiences by academics with theories that may soon be defunct.

FROM WINNER-TAKE-ALL TO FIRST-MOVER-WINS

If the market is going to become dominated by a small number of companies – perhaps as few as one – how does a company get to be that top dog? The typical answer has been: "Get established first. At any cost."

The idea that being first is essential is a truly pernicious bit of faux wisdom; it has helped companies throw themselves madly off cliffs like lemmings, thinking they were bound for glory. I do not wish to split hairs over the first-mover advantage versus, say, the virtues of being second a week later, for that is a distinction without a difference. It is really the idea that early movers have a large lead over later movers that deserves a good part of the blame for giving credibility to the misguided business plans of the e-commerce companies.

Finding examples of this view is easy. Indeed, the ubiquitous nature of this claim is nicely illustrated in a column in *eCompany Now*:

> "We have the first-mover advantage," Women.com CEO Marleen McDaniel told CNBC in June 1999. "They have the first-mover advantage," a Zona Research analyst told a reporter, explaining why eToys's stock was a steal. "Eve.com is an outstanding e-commerce opportunity with a first-mover advantage," Idealab founder Bill Gross bragged in a press release. As Draper Fisher Jurvetson partner Tim Draper told *USA Today* in October 1999, the first-mover is "usually the (company) that's going to win it."

Each of these companies, it's worth mentioning, soon went belly-up.

Or consider this advice from University of California economists Carl Shapiro and Hal Varian's *Information Rules*, one of the more

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reasonable books of advice on getting ahead in the information economy:

> First-mover advantages can be powerful and long-lasting in lock-in markets, especially those in information industries where scale economies are substantial. If you can establish an installed base before the competition arrives on the scene, you may make it difficult for later entrants to achieve the scale economies necessary to compete.

Of course, as proper academics, Professors Shapiro and Varian are somewhat circumspect about claiming the advantages of being first. They do not say that being first does ensure an advantage, only that it might. Still, for a business audience that finds sufficiently deep meaning in *Who Moved My Cheese?* to keep it on top of the best-seller list for years, these nuances are unlikely to be noticed.

In any event, in the "Lessons" section of *Information Rules*' Chapter 6 – which, I suspect, is where busy readers are likely to gain their insights – we find less circumspect sentences:

> Be prepared to invest to build an installed base through promotions and by offering up-front discounts. You can't succeed in competitive lock-in markets without making these investments.

Kevin Kelly is yet more exuberant in his popular book, *New Rules for a New Economy*. Discounting to get market share, Kelly explains, isn't enough – you need to give it away. He offers 10 "rules," the fourth of which is "Follow the Free." Here is the gist:

> As crackpot as it sounds, in the distant future nearly everything we make will (at least for a short while) be given away free – refrigerators, skis, laser projectors, clothes, you name it. Talk of generosity, of information that wants to be free and of virtual communities is often dismissed by businesspeople as youthful new-age idealism. It may be idealistic but it is also the only sane way to launch a commercial economy in the emerging space.

At least Kelly understood that giving away nearly everything sounded like a crackpot idea. The problem was that he didn't seem to understand that it didn't just sound like a crackpot idea – it was a crackpot idea.

This is not to deny that giving a product away may sometimes make sense. Free samples have been around forever. But the talk of information wanting to be free is nonsense. And the idea that refrigerators, laser projectors and clothing will be given away indicates a serious misunderstanding of the importance of network effects – the idea that the more people who use a product, the more valuable it is to each – in e-commerce. Kelly's advice is grossly overstated at best and, more often than not, has been shown to produce astronomical losses with no chance of making enough profit down the road to provide a normal return.

Last, but not least, we have W. Brian Arthur, the pied piper of lock-in. Arthur has received near-universal adoration from the media for his articulation of the lock-in effect and his claims of reinventing the idea of increasing returns to scale. In a 1998 *Harvard Business Review* article, Arthur tells business strategists, "Two maxims are widely accepted in knowledge-based markets: it pays to hit the market first, and it pays to have superb technology."

Yet that same year he discarded even the importance of having good technology:

> You have to allow that you are playing games where the winner can walk off with a great deal of the market and the losers are left with practically nothing, even if their products are technically brilliant, and the cost is right. So basically the strategies are very much the strategies you would apply in pres-

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idential primaries. You want to build up market share, you want to build up user base. If you do, you can lock in that market.

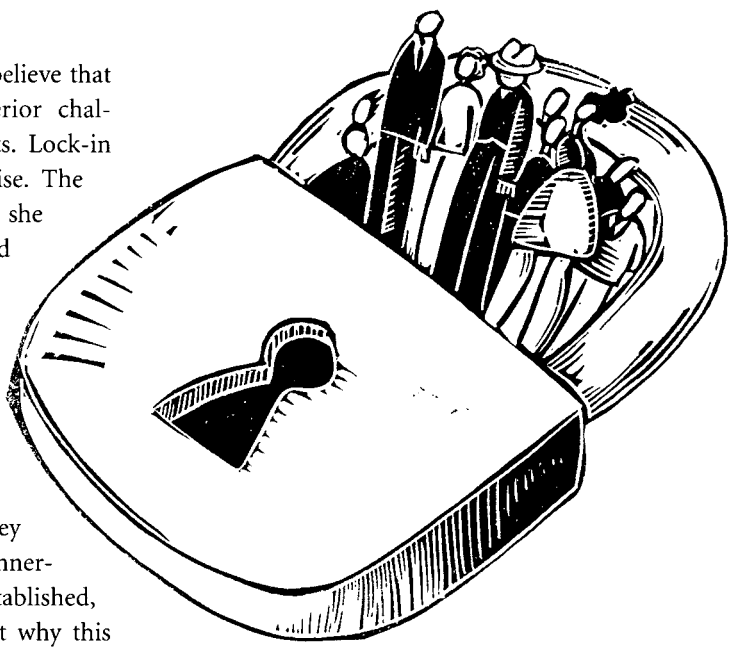
So much for the world beating a path to your door because you have built a better mousetrap. The winner might have mundane products, so-so quality and high prices. But the second-rate company wins because it got to the starting line first and locked in its customers – at least as Arthur tells it.

THE CONCEPT OF LOCK-IN

On its face, there is no reason to believe that incumbents can beat back superior challengers in winner-take-all markets. Lock-in theory, however, suggests otherwise. The winner not only takes all, he or she keeps taking it – even when pitted against a better rival. In this view, if the first entrant gets the largest market share, lock-in will keep the company's customers immobile and the company entrenched in the leading position.

In the telling of the lock-in story, network effects play the key role. Network effects lead to winner-take-all, and once the winner is established, they keep competitors at bay. Just why this would be so has to do with a particular coordination problem described below. Although the research focuses on network effects, economies of scale could have been used instead since they also can lead to a winner-take-all outcome.

Compatibility is also crucially related to lock-in concepts. In deciding which type of product to buy, consciously or not, consumers make a series of calculations. Of course, they compare the prices and qualities of the products. But they must also reckon with the costs of learning how to use a new product. And in network markets, they also need to take account of the strength or size of the competing networks in order to gauge the size of the network effects associated with the competing products. For example, in the early 1980s, a consumer choosing between a VHS and a Betamax VCR needed to guess about the future popularity of the competing formats in order to estimate the amount of programming that would be available to rent or buy.



It is this need to gauge what others are doing that leads to the possibility that consumers could get locked into a product and find it impractical to switch to something better later on. How that might work in theory is the subject of numerous economics papers. How it has worked in the real world is the subject of a far smaller – and, as we shall see, notably faulty – literature.

Lock-in costs fit two distinct categories. First, there is always a cost to changing brands – breaking old habits, becoming familiar with the new product and in some cases not being

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able to use the new product with old products. For example, new word processing software may not be able to read documents created on the discarded software. These are the costs of being compatible with one's self.

Second, there may be costs in losing compatibility with others. Think of someone wishing to switch from VHS to Beta and finding a dearth of prerecorded Beta movies available at the video store – or someone switching to Lotus WordPro and finding they have trouble exchanging documents with their colleagues who use Microsoft Word.

These factors – being compatible with one's self and being compatible with others – play an important role in understanding how lock-in works. What's more they play a key role in defining the difference between the weak and strong forms of lock-in. The strong form supports the concept of first-mover-wins. The weak form does not.

I must warn you that this distinction is not one normally made in the literature. Instead, all forms of lock-in are lumped together. Yet it is only the strong form of lock-in that leads to potential coordination problems, and only the strong form that leads to the new strategy of first-mover-wins.

Strong-Form Lock-In

A strong form of lock-in exists when a better product is not adopted, even though the quality difference is sufficient to overcome any self-compatibility issues for consumers. In such a case, the switch would only occur if consumers didn't care about compatibility with others. Network effects, if they exist in a market, bring compatibility with other consumers to the fore. That's why the issue of whether superior products can overcome the lead of inferior incumbents has been closely associated with network effects.

Note that if the benefits of the new technology were not sufficient to trump learning costs and/or inability to use old products, it would be inefficient to replace the old technology with the new. After all, the time and effort to learn how to use a new word processing program or a new appliance are real costs.

Only the strong form of lock-in leads to potential coordination problems, and only the strong form leads to the new strategy of first-mover-wins.

Most important, if strong lock-in exists, it may make sense for sellers to try to get a large market share even if the costs of doing so are very high. That is because challengers, even those with superior products, may not be able to overcome the lead of the early birds. This is the basis for the belief in first-mover-wins.

At least in principle, incompatibility with other users can prevent a superior challenger from vanquishing an incumbent. With this strong form of lock-in, even though all consumers would like to switch if sufficient numbers of other users also switched, the inability to coordinate behavior prevents consumers from actually switching.

Let's pretend that the Betamax video recording format is universally acknowledged to be better than VHS. Because each consumer

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fears that others will not switch and that, as a result, most prerecorded movies will not be available on Beta, all consumers stick with VHS. Here, we would all be better off making the change, but we do not make the switch because we cannot coordinate our actions.

This strong-form lock-in story has beguiled many an economist, particularly since there seemed at first to be evidence to support it. It is not just a story of incompatibility with others, however. At its core, this strong-lock-in story assumes that each user believes that others will continue to use the inferior product, even though everyone knows that the challenger's product is superior.

When a challenger enters the market, the two types of compatibility appear to favor the incumbent. Compatibility with one's old behavior imposes costs on a switch. And the incumbent, by definition, has a larger market share. However, when consumers go through a calculation about the value of switching, it is rational for them to project what the future will look like. Otherwise, the first automobiles would never have been sold since there were no gas stations, and the first fax machines wouldn't have been sold since there were no faxes to receive and no one to send faxes to. Thus it is the expectation of the size of the networks that actually matters. If consumers believe the challenger will do well, the market shares at the time of purchase need not be particularly relevant.

So, in fact, the importance of compatibility with others does not necessarily favor the incumbent. Challengers able to demonstrate the superiority of their products may very well prevail, as would be required if the market were working efficiently. Therefore, it is uncertain, in theory, whether strong forms of lock-in are likely to occur.

Examples of strong lock-in, such as the typewriter keyboard and the videocassette recorder format, have been proposed. But as I discuss below, these examples simply don't survive close examination.

It might appear that winner-take-all brought about entirely by economies of scale would also be capable of generating strong-form lock-in for an incumbent. In such cases, after all, challengers enter the fray with higher costs than the incumbents. But that need not deter a challenger prepared to invest sufficient resources to achieve large scale. The task facing a company trying to overcome network effects appears less simple because it requires overcoming the impact of the existing stock of the incumbent's product and influencing expectations about the market shares down the road.

Weak Lock-In

Alternatively, a company may sell a product that is superior to the incumbent's, but not sufficiently superior to cover the self-compatibility costs associated with switching. Suppose a competitor to Iomega produced, at an identical cost, a Zip-like PC storage drive in an incompatible format with a minor improvement in capacity – say, from 250 MB to 260 MB. Current Zip drive users would be unlikely to switch to the new system since its very small advantage would not make it economical to throw out the old Zip drives and disks and replace them with the alternative.

Users of Zip drives can be thought to be weakly locked in to the Zip system. Here, it would be inefficient for current consumers to switch to the new product. And though the term "lock-in" is used to describe this situation, it is quite different from the strong form of lock-in. If the incumbent already dominates a mature market, it is efficient for it to remain dominant.

There are many, many instances of weak lock-in. You are unwilling to purchase a new

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computer merely three months after buying your current one, even though the latest models are slightly better. You continue driving your car even after models with more horsepower come to market. You continue to live in a five-bedroom house after the kids have grown up and left. All of these, and millions of others, are examples of weak lock-in. And all provide limited protection to incumbents.

Weak lock-in has nothing to do with network effects or economies of scale. Weak lock-in shouldn't demand new business strategies since it has been around for so long that old strategies should have taken it into account. Indeed, weak lock-in has little to do with moving to an information economy unless we think that learning to use digital products is more difficult than learning to use old analog systems.

The final difference between the two forms of lock-in is that it is efficient for the economy to stay with the incumbent if the incumbent is weakly locked in. The costs of learning a new system are real costs, and if the advantages in using the new product do not outweigh those costs, it is efficient for society to stick with the old. Strong lock-in, on the other hand, creates inefficiency: if all the users of the old product switched, they would all be better off even after the costs of switching are included.

IMPACT OF LOCK-IN ON FIRST-MOVER-WINS

Proponents of the strong form of lock-in implicitly assume that, even if consumers wanted to switch to a better product, fear that others would remain with the old product constrains their behavior. The challenger not only has to produce a better product that can overcome self-compatibility, but must also overcome the consumer's cost of going it alone in a world full of network economies.

Critics of strong lock-in, by contrast, believe that the expected market shares will depend mainly on the self-compatibility question. In other words, if the new product is sufficiently better than the old product that it pays individuals to switch (ignoring network effects), then consumers will expect other consumers to switch, too. The new, superior product will thus triumph.

If the strong form of lock-in were to hold, it would pay for producers to get to market first and largely ignore relative quality. The weak form of lock-in, on the other hand, implies that the key to winning is to offer a product that is good enough to overcome consumers' switching costs. Unless self-compatibility costs are very large, a better product will likely be able to overcome the incumbent.

Emerson's dictum to build a better mousetrap would still apply in the sense that a better mousetrap is understood to be one that is sufficiently better to overcome the costs of self-compatibility. While it is possible that self-compatibility costs could be so large that the original seller would win, this outcome seems unlikely. It hardly justifies a claim that, in the new information-based economy, rushing to market is a winning strategy even though it wasn't in the past.

The weak form of lock-in has been around forever. It can be found in the most mundane activities. I am used to going to a particular gas station, and will go there even if gas is a penny or two lower across the street. Does that imply that, to get my business, competing gas stations must cut their prices by one-half to two-thirds – a number that has been put forward by Arthur as the percentage differential required to break lock-in? Obviously not; surely most users would switch if the cost of gasoline were 10-15 cents a gallon lower. Weak lock-in is thus an unlikely candidate to

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support first-mover-wins strategies.

STRONG LOCK-IN IN THE REAL WORLD

If it is to be relevant to the information economy, the concept of first-mover-wins requires a strong form of lock-in. Yet, there is no evidence that strong-form lock-in actually occurs. Altair, VisiCalc and Ampex – the first companies to produce PCs, spreadsheets and VCRs, respectively – are not the leaders in those markets today. Nor, apparently, are there other examples waiting to be discovered.

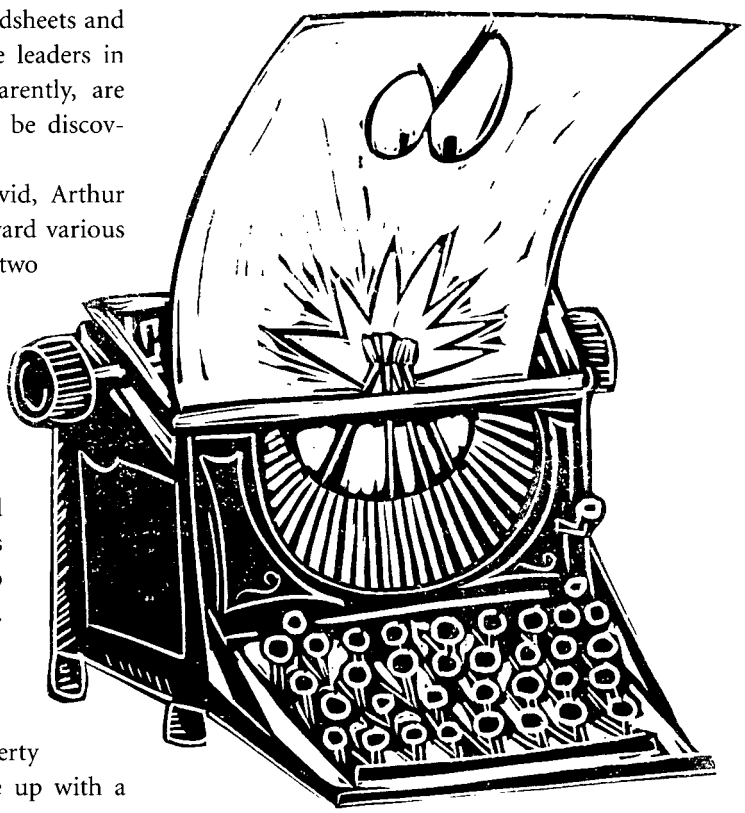
Economic historian Paul David, Arthur and their students have put forward various pretenders to this throne. The two most popular examples of truly pernicious strong lock-in are the typewriter keyboard and the VCR. But both are based on a misreading of the facts.

The keyboard story was introduced to economists by David and has been repeated numerous times – for example, in Shapiro and Varian's *Information Rules*. The story starts with the claim that, to prevent jamming of the keys, the typewriter mechanics who worked on the original Qwerty machine in the late 1800s came up with a design to slow down typing.

Not a shred of hard evidence has been offered in support of this claim. Rather, it appears that, to prevent jamming, the keyboard designers placed letters to maximize the probability that successive letters would be typed by alternating hands. But that doesn't slow typing – it actually speeds it up.

In the 1930s, August Dvorak, a professor of ergonomics at the University of Washington, patented a keyboard design after a systematic examination of which letters and pairs of letter were most commonly used in English writing. He then positioned the keys to minimize the distance the fingers traveled. Dvorak claimed that this keyboard design worked much better than the Qwerty design.

A study conducted by the U.S. Navy during World War II purportedly demonstrated that



Dvorak's keyboard was indeed 40 percent faster than the Qwerty design. However, if one examines the Navy study, one discovers important irregularities that biased the results in favor of the Dvorak keyboard.

A more significant problem with the claims of Qwerty's inferiority is that Qwerty detractors ignore the results of another study. In the 1950s Professor Earl Strong of Penn State compared the two keyboard designs for the General Services Administration (GSA).

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His findings received a great deal of publicity, with reports published in leading newspapers, including *The New York Times*. Strong found that Dvorak was not superior to Qwerty. He also reported that the earlier study by the Navy was overseen by the Navy's chief expert in such matters, none other than Lieutenant Commander August Dvorak!

While it is more readily available than the Navy study, the GSA study was ignored by advocates of strong-form lock-in. There are critiques of Strong's study in the research literature. But the consensus in that literature appears to be that there is little difference in performance between the two keyboard designs. It is also worth noting that modern ergonomic studies of the keyboard and other experiments examining the costs of retraining typists to use the Dvorak keyboard are consistent with the GSA results – and inconsistent with those reported by the Navy study.

This more complete history of the keyboards has been available since 1990, but is almost never reported when lock-in advocates promote their version of the keyboard story. If they present any evidence contrary to the lock-in story, it's usually buried in a footnote.

The use of the VHS/Beta story as an example of lock-in, or first-mover-wins, is even more flawed. The Beta format actually had a head start of about a year-and-a-half over VHS. Hence it might be natural to ask where its first-mover advantage was, since it was soon routed from this market by VHS.

The proponents of lock-in report (correctly) that the VCR market wasn't yet mature, and that the number of units sold was too small to give much of an advantage to Betamax. But perhaps the reason the videocassette recorder market didn't mature more rapidly under Sony's tutelage was the fact that the first Betamax machines could only record for one hour – making it impossible to watch or record a movie on a single tape.

Lock-in theory survives and flourishes mostly due to the popularity of the economic theory that demonstrates that it could happen, and on the hopes of those who put forward the theory in the first place.

VHS used a larger cassette, but otherwise was based on virtually identical technology. The companies behind the two formats (Sony and Matsushita) had a patent-sharing agreement since they had jointly produced a prior-generation videocassette recorder. In fact, when Sony engineers first saw the VHS machine, they thought it was a clone of the Betamax. VHS's much bigger tape allowed a longer playing time for a given quality of picture. It was the inferior playing time that led to the demise of the Betamax – not the fact that it was first, second or third.

Now, you might expect belief that this strong form of lock-in must depend on more than just these two feeble stories, given its impact on current thinking (not just business strategy but antitrust prosecutions such as the Microsoft case). And it does – but not much more. Lock-in theory survives and flourishes mostly due to the popularity of the economic theory that demonstrates that it could happen, on a few other less plausible real-world

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examples, and on the hopes of those who put forward the theory in the first place.

Arthur and others have claimed that the internal combustion engine locked out superior alternatives such as the steam and electric engine. If this seems pretty far-fetched, it's because it is far-fetched – but not so far-fetched to avoid serious academic scrutiny, particularly by those hoping to find evidence of strong-form lock-in. The research simply hasn't supported the conclusion.

Other possibilities have been suggested. Perhaps AM stereo should have replaced FM. Perhaps DC should have replaced AC as the standard for electrical generation and transmission. Perhaps quadraphonic sound should have replaced stereo. Perhaps the Macintosh operating system should have replaced DOS (a Mac-like graphical operating system did, but it was called Windows). Perhaps railroads used the wrong gauge of tracks for their trains. But advocates have never gotten beyond "perhaps."

Arthur and David have recently tried to turn the debate around by claiming that it is not they who should have to find strong forms of lock-in. Rather, the skeptics should have to prove that every market yields the most efficient product.

Arthur has noted in several interviews that we (Liebowitz and Margolis) have not proved that Qwerty is the best possible keyboard. Indeed; but we have never made any such claim. Even if other keyboards were equally good or slightly better (which is what we did conclude), there is no reason to take this as evidence of strong-form lock-in.

In the examination of software markets that I conducted with Margolis – the only study of its kind that I know of – we found over and over again that the winning product is as good as or better than the competition. Even though these markets appeared to have winner-take-all characteristics, exhibiting both network effects and economies of scale, and even though the market leaders had very large shares consistent with winner-take-all, good products trumped lesser ones whether or not they were there first.

VisiCalc, the first spreadsheet, was supplanted by the superior Lotus 1-2-3, only to be replaced by the superior Excel. Managing Your Money was supplanted by Quicken, and so forth. This was true for markets in which Microsoft was a player and in markets in which it was not. It was true for Macintosh markets as well as Windows markets.

THE INTERNET AND FIRST-MOVER-WINS

For the most part, online retailing does not have the characteristics of a winner-take-all or first-mover-wins market. Likewise, most online markets do not exhibit network effects or instant scalability. Economies of scale, on the other hand, could be important here. But there is little reason to think that bricks-and-mortar companies in the same industry would not possess equivalent economies of scale.

Take the case of Amazon.com, the company famous for its strategy of forgoing current profits in order to establish its brand name and generate a large market share – a company willing to lose almost 50 cents for each dollar of sales in the name of market-share growth. Was this a smart move? Does online book-selling exhibit the economic characteristics that will lead to winner-take-all or first-mover-wins?

The creation of a Web site represents a fixed cost, perhaps imposing some scale effects on the product market since the overhead costs per unit sold falls as output increases. But other costs of doing business on the Web are likely to swamp the cost of

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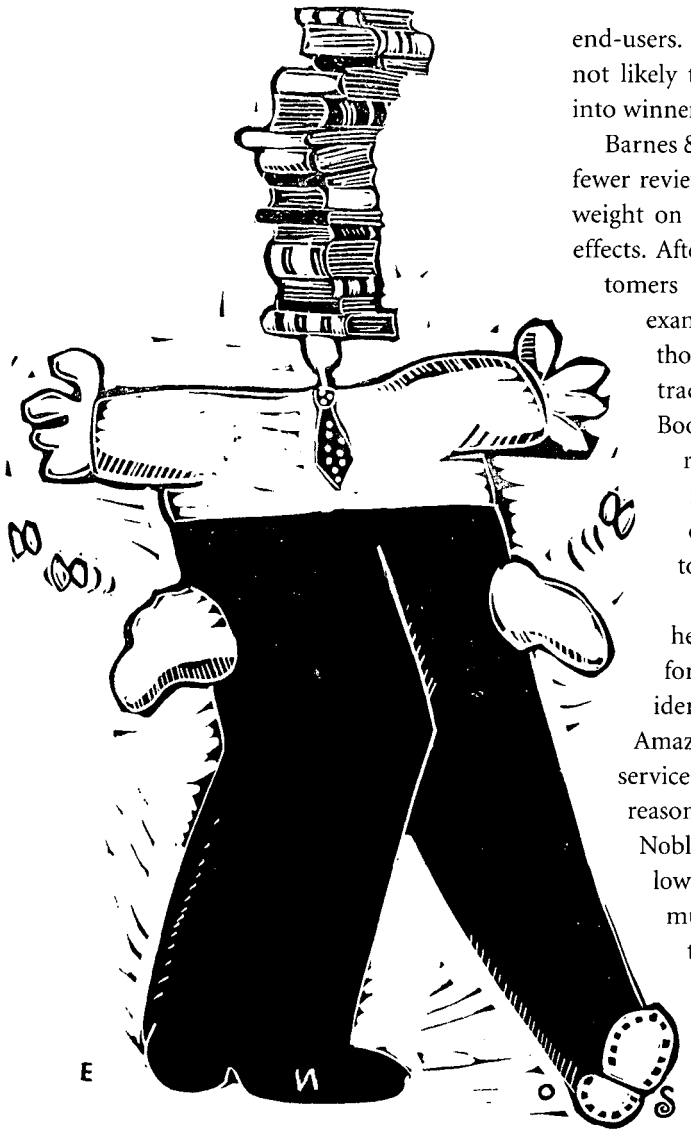

creating the Web site. Therefore, the fixed-cost component is likely too small to dominate Amazon.com's overall average costs.

Network effects for Amazon.com are also very limited – things like product reviews by users and purchase circle information, but little else. Product reviews have network effect characteristics because the number of reviews depends on the number of other users, and these reviews increase the value of the site to end-users. But the value added by reviews is not likely to be sufficient to turn a market into winner-take-all.

Barnes & Noble's Web site, which offers far fewer reviews, apparently never put as much weight on the importance of these network effects. After all, it could have prodded customers to provide more reviews by, for example, offering discount coupons to those who wrote reviews or by contracting with an organization like Book Review Digest to provide major reviews. But even if reviews are significant, the resulting network effects are surely too small to lead to strong-form lock-in.

Any lock-in that might occur here is almost certainly the weak form: familiarity with the site, brand identity, pure habit. In any event, Amazon.com does provide high-quality service and low prices, so there is little reason for users to switch. Barnes & Noble would need to provide either lower prices or higher quality to have much hope of getting Amazon customers to defect in large numbers.

Amazon.com's winner-take-all characteristics, therefore, are largely limited to those enjoyed by conventional booksellers. If bricks-and-mortar book-selling is not winner-take-all (and for all the bookstore consolidation that has occurred in recent years, Barnes & Noble and Borders each hold only about 10 percent of the book retailing market), online book-selling is also unlikely to be a winner-take-all market. Thus Amazon.com's enormous startup losses may have been largely without purpose except to create brand-name recognition and to provide a quality experience for consumers – worthwhile goals, per-

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haps, but hardly ones that justify such enormous outlays.

ADDITIONAL EVIDENCE

In 1999, I conducted a study for McKinsey, the consulting firm, trying to determine what causes companies to be successful. I looked at 20 markets ranging from high-tech (Web portals) to low-tech (athletic apparel and discount retailing). My conclusions were quite consistent with those I drew from my research in software markets.

There was a very strong relationship between companies producing the best quality product (bang for the buck) and those that were most successful, as measured by either above-normal profit, large market shares or high stock market returns. Since PC manufacturers, software producers and Web-site portals were all included in the study, the study offered fresh evidence to support the conclusion that building the better mousetrap remains an essential ingredient for success – even in high-tech markets.

In personal computer production, for example, being first didn't count for much. Dell was not the first seller of PCs. IBM, Tandy, Kaypro and many others (some long forgotten), all beat Dell to market. What Dell has achieved – and maintained for a long period – was a reputation for selling better products needing fewer repairs. Packard Bell, by contrast, gained a large market share with low prices, emerging as the largest seller to home users in the early 1990s. But Packard Bell was plagued with poor quality and service, and was only saved from bankruptcy by merger with NEC in the late 1990s.

STEPPING BACK

The concept of lock-in, which has proved so appealing to business strategists – particularly those of an academic stripe – is subtler than has generally been understood. The type of lock-in that supports claims of first-mover advantages is nowhere to be found.

A company that takes big losses in order to win the market-share wars is likely to find that it has won a Pyrrhic victory. Businesses that invest enormous sums for early advantage are likely to fail. Indeed, the meltdown in high-tech can largely be blamed on misguided efforts to be first, even if that means selling a so-so product.

That does not mean, however, that the concept of winner-take-all is discredited. There is good evidence that high technology does breed conditions that lead to very large market shares for successful companies. A firm with a dominant market position, however, can expect to maintain that position only as long as it pleases consumers.

Many – perhaps most – Internet markets are no more likely to be winner-take-all than their bricks-and-mortar counterparts. For many, the Internet will offer a means of enhancing the business, but it will not bring about a fundamental restructuring of the business model.

The winning strategy for Internet companies is the probably the same as the winning strategy for bricks-and-mortar companies: make better products at lower costs. This strategy has worked countless times in both low-tech and high-tech industries, and it is not easy for competitors to copy successfully.

The choice between rushing a weak product to market to be first or taking the time to be best should be a no-brainer, although it wasn't for many beguiled by the lock-in story during the Internet mania. By the same token, a late start is not an insurmountable obstacle. Good Web businesses that continue to innovate may hold their positions for a long time, but not because they can expect to milk locked-in customers. M

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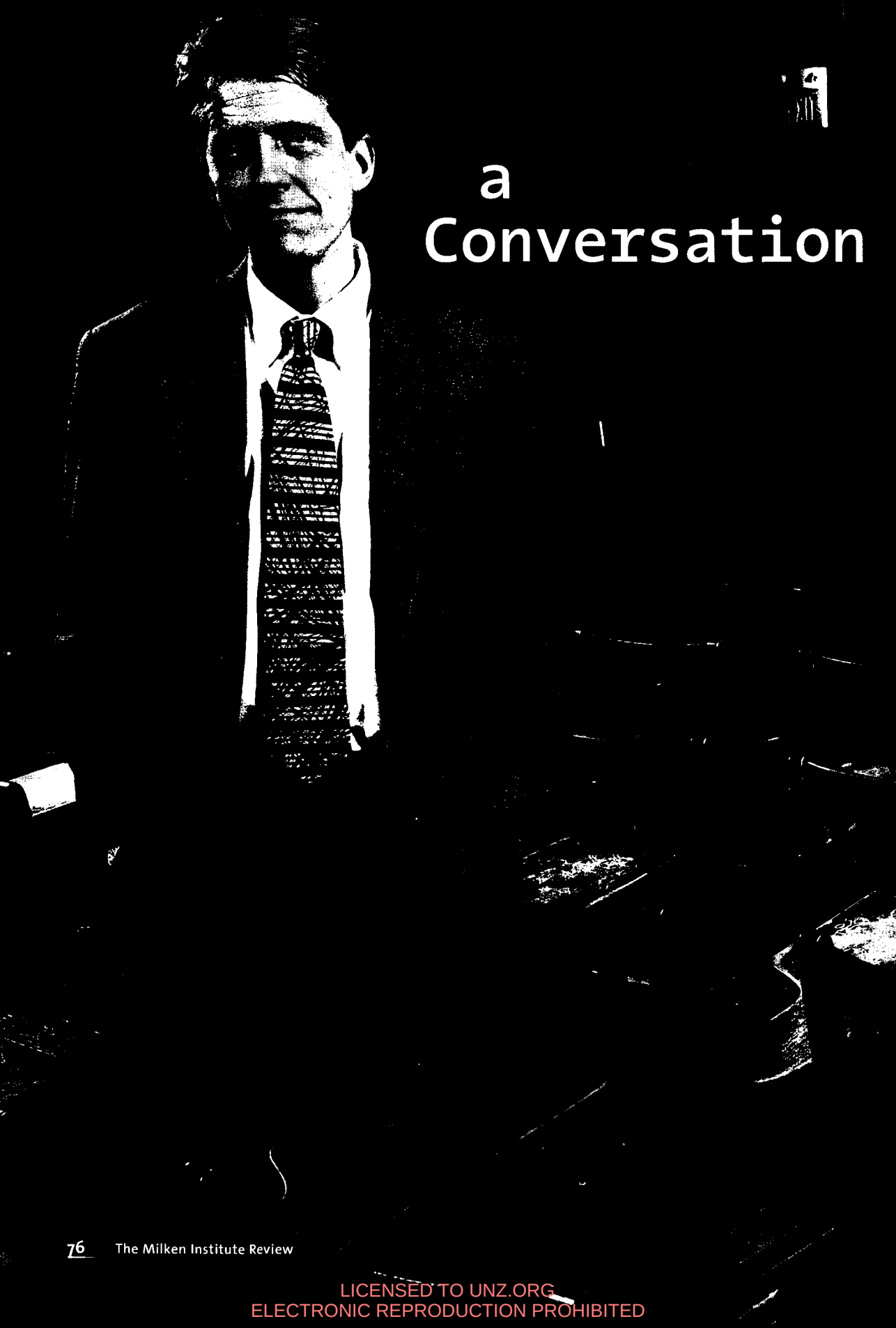

a Conversation

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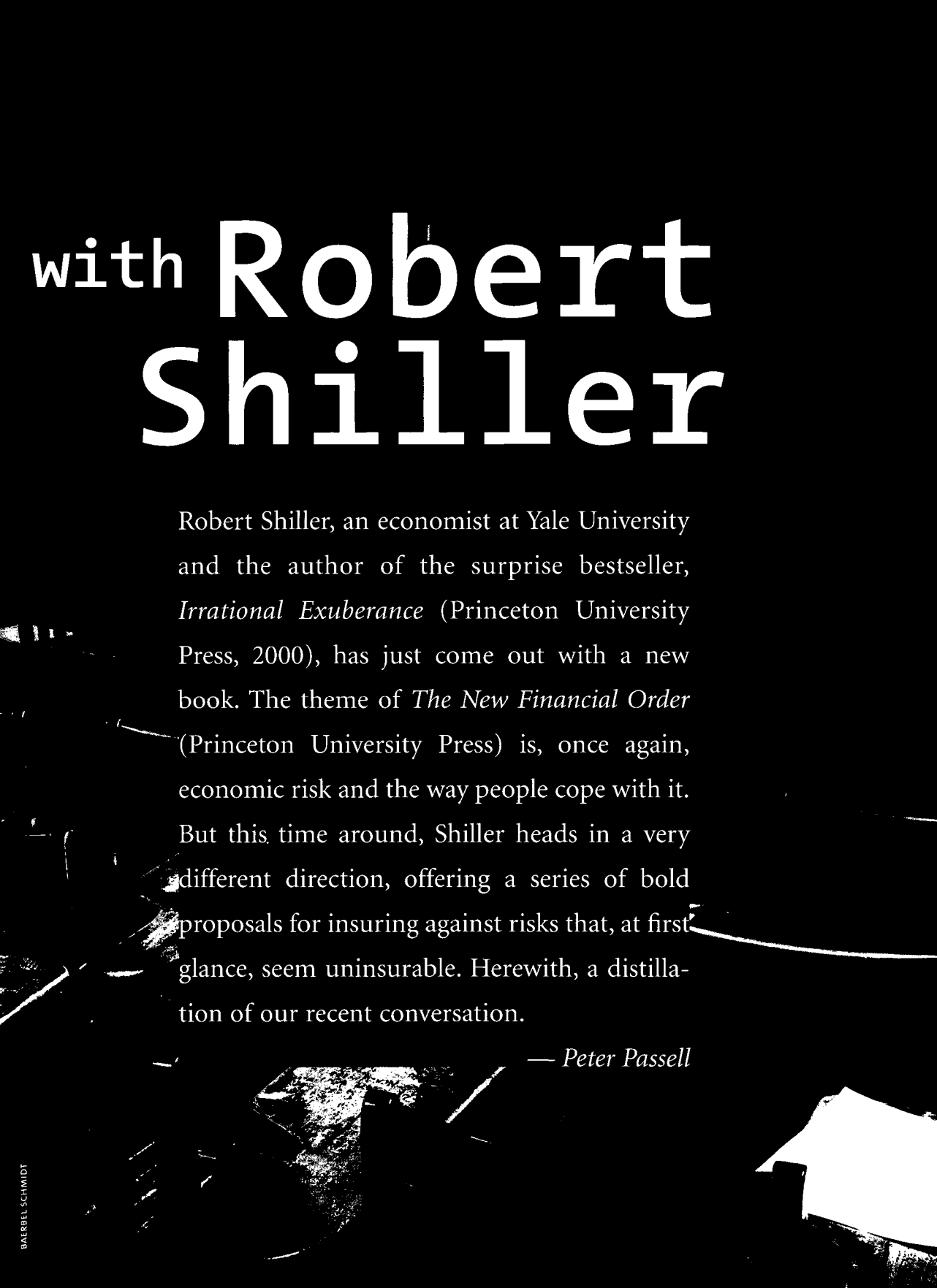
with Robert Shiller

Robert Shiller, an economist at Yale University and the author of the surprise bestseller, *Irrational Exuberance* (Princeton University Press, 2000), has just come out with a new book. The theme of *The New Financial Order* (Princeton University Press) is, once again, economic risk and the way people cope with it. But this time around, Shiller heads in a very different direction, offering a series of bold proposals for insuring against risks that, at first glance, seem uninsurable. Herewith, a distillation of our recent conversation.

— *Peter Passell*



BAERBEL SCHMIDT

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Unfortunately, the insights of finance have been applied in only a limited way. Risk sharing has been used primarily for certain narrow kinds of risks... [with] benefits that accrue mainly to already well-off members of our society.

Finance, however, has substantially neglected the protection of our ordinary riches – our careers, our homes, our years of retirement, and our very ability to be creative as professionals.

Note: all sidebars are quotations from *The New Financial Order*

PETER PASSELL: Since the publication of *Irrational Exuberance* you have become a bit of a media star – the economist who explains economics to non-economists. Has that required a lot of gear-changing?

ROBERT SHILLER: It was a good thing for me to do. Academia encourages specialization – it's like a team sport, where you're supposed to keep to your position. The system works pretty well. But when you try to talk to the public, your training sometimes gets in the way. Adjusting proved to be great fun – explaining ideas without the help of jargon broadened my understanding of economics.

PP: The new book on risk is quite well-written. Did you get a lot of editing help, or is that the real you?

RS: Well, I did have fine editors at the Princeton University Press and my wife Ginny pointed out when I was getting too technical for a broad audience, and helped me smooth out some rough spots. But, yes, that is the real me.

PP: *Irrational Exuberance* took a whack at Americans' obsession with the stock market. And at a rather opportune time, since the book came out just as the tech stock bubble burst in March 2000. Care to tell us what's in your own securities portfolio now?

RS: Mostly cash. We just sold our business. I had a student, Alan Weiss, who had the idea of selling the single-family home-price indexes that Karl Case [a professor of economics at Wellesley College] and I had developed. And so we created this company, Case Shiller Weiss in 1991, which Alan developed into a substantial company selling automated home valuation services and risk management products. Last May, we sold it to Fiserv, a big financial data services company in Wisconsin. And we got what sometimes seems to me like a lot of money from that.

PP: Who says academic economists are dummies at business...

RS: And since we're just now in the process of taking the company apart, we've got the money in Treasury bills.

PP: So this is not an insight into your views on the market?

RS: Well, I don't have much stock in my personal portfolio. On the other hand, I never "shorted" the market, which is something that you might have thought I'd do. But I was never confident enough to predict when the bubble would burst. I always thought the market might still go up.

PP: What really big mistakes do ordinary investors make?

RS: People depart from economists' models of rationality in so many ways that it's hard to know where to start. They tend toward overconfidence. They have lapses of attention. They tend to focus on little risks rather than big risks. They doubt the importance of diversification and hedging. They trust intuition too much. Their self-esteem gets tangled up with the idea that they'll beat the market – that, "my brilliance will be revealed in my investing successes."

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PP: That's a nice segue into my next question. Do you believe that it would be good public policy to let individuals control their own Social Security investments?

RS: Left to their own devices, people are not very reliable in providing for their own old age. So it seems a little funny to have a system that forces them to save for old age – presumably because many won't save for retirement on their own – but then assume they will invest the forced savings responsibly.

TIAA-CREF, the pension fund for college professors, finds that most people follow very simple rules of thumb in deciding on portfolio allocations, and then they just forget about it completely.

I think that we need a Social Security system that takes care of people, because many people will mess up on their own. Of course, the proposals that have been recently aired would only direct a small fraction of Social Security contributions into discretionary personal accounts. And so these little tinkerings are probably not so serious.

PP: But is there any value at all to privatizing portions of Social Security?

RS: Not from where I stand. One purpose of Social Security is to force people to take care of the old, because many don't provide for old age. But the other thing the system ought to do is help manage risk.

Social Security should be designed to spread risk rather than to concentrate it on individuals. And with individual accounts, some people will undermine the purpose of the system by investing heavily in high risk assets. We have seen that happen already in Hong Kong and Sweden, which allow workers to invest their public pension contributions. A lot of people have lost much of their savings because they put it in a tech fund or the like.

PP: So some people are inclined to take inappropriate risks with their savings. But that puts the cart before the horse: do people save enough?

RS: No. Americans' personal savings rate has been around 2 percent. It fell as the market boomed – it seems people were very optimistic about the future. People are adjusting their savings upward somewhat now. But the rate is still much too low.

PP: What's an adequate level of savings?

RS: It's no longer uncommon for people to live into their 80s or even 90s. And so the average person may be looking at 30 years of retirement. We also have to remember that when the baby boom generation retires, that there will be relatively few young people to take care of them. And so the boomers ought to take care of themselves by saving as much as possible.

PP: Care to give us a ballpark of what it ought to be?

RS: Something like 10 percent is a good target, and we aren't close to that now.

Democratizing finance means solving the problem of gratuitous economic inequality – that is, the inequality that cannot be justified on rational grounds in terms of differences in effort or talent.

Finance can thus be made to address a problem that has motivated utopian and socialist thinkers for centuries.

Indeed, financial thinking has been more rigorous than most other traditions on how to reduce random income disparities.

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Most long-term economic risks that people face are borne by each individual or family alone. Social welfare exists primarily for the very poor, but is limited even for them.

In today's world, we cannot insure against risks to our paychecks over years and decades. We cannot hedge against the economic risk that our neighborhoods will gradually decay. We cannot diversify away the risk that economic and societal changes will make our old age difficult…

PP: In *Irrational Exuberance* you argued that Americans paid too much attention to variations in stock prices. Would you like to see less trading in stocks – maybe with a little help from a tax on stock sales?

RS: That idea, which originally came from my late colleague at Yale, James Tobin, is interesting, but I've never endorsed it. It's just not clear that making stock trading more expensive would help.

The fundamental problem – attitudes toward investing – is a psychological one. And making it more difficult to trade stocks wouldn't change those attitudes. A turnover tax is not a solution to the fundamental problem: people enjoy speculation.

Consider housing. The costs of buying and selling are enormously high – in the neighborhood of 6 percent of the value of the house. But housing markets go through booms and busts just like the stock market, where trading is cheap and easy.

PP: Well, how about discouraging the rapid dissemination of information about stock prices? Would you like to see less emphasis on "marking-to-market" the value of securities portfolios?

RS: Same problem. There are cases where we have speculative bubbles even where there are really no markets. One example is careers. Young people flocked to careers in investment banking and Internet startups on the flimiest evidence that they would succeed.

Speaking of which, I think it would be good idea – indeed, it is one of the ideas in my new book – to create markets to share the risks associated with earning income.

PP: Glad you mentioned the new book. The proposals in the book imply there is a lot of "market failure" out there, in the sense that if efficient insurance markets existed, individuals could insure against many of the economic risks of daily life – and at premiums they would find attractive.

RS: That's right. Once we had such markets, people could make their own choices. It's sort of like when you shop around for an insurance policy. Policies that cover more risks are going to cost more money. But because risk management is generally not very expensive, the prices often look like bargains.

PP: All of the risk management proposals in the book imply that you could increase personal welfare by implementing them. To put it another way, without efficient markets for risk management, the economy operates at less than its potential. Do you have a sense of how much better off, in terms of dollars of income, people would be if we fully exploited this potential?

RS: I published such calculations in a paper with a student. The estimates were modest – just a few percentage points of GDP. But I think if you take a broader view, the number would be much, much larger.

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One reason why it's hard to be precise is that when you improve risk management, people's behaviors change in fundamental ways. They're much more likely to take risks if they can control them. And risk-taking behavior is an engine of economic growth. So if people were sheltered from unnecessary risks, we could expect a payoff in faster economic growth.

PP: This is a supply-side argument – that if people could manage risks better, they could act in more daring ways.

RS: Right. One reason that the advanced-country economies have done so well over the long haul is that we have long had substantial risk management capacity in business. Most of our wealth comes through companies, and corporations have a variety of ways to spread the risk of investment.

If you told people that if they wanted to go into business, they'd have to mortgage their houses and take all the consequences if the enterprise failed, no one would start a business. Ever since stock markets became a dominant institution in advanced countries, economic growth has been very much propelled by risk management.

PP: And ironically, the ability to control risk gives you the ability to take more risks.

RS: Right. If you went back to the early 19th century, before the invention of modern capital markets, could anyone have envisioned how much the economy would change? If every country had decided there would be no financial risk-sharing whatsoever – if there were no bankruptcy laws and people who couldn't pay their debts went to prison – imagine how much less the world economy would have grown.

So if you look forward, imagine a world in which risk management were extended down to the personal level. There's no way to quantify the potential gains – but I'm sure they are large.

PP: Essentially, what you're proposing are a bunch of ways to reduce systemic risk. For example, the risk of choosing the wrong profession or the risk of retiring at a time when those still working aren't prosperous and can't afford the taxes to cover your monthly check. All of these changes, it strikes me, would reduce incentive to care about government economic policy, because insurance markets would insulate individuals from the long-term consequences of bad policy.

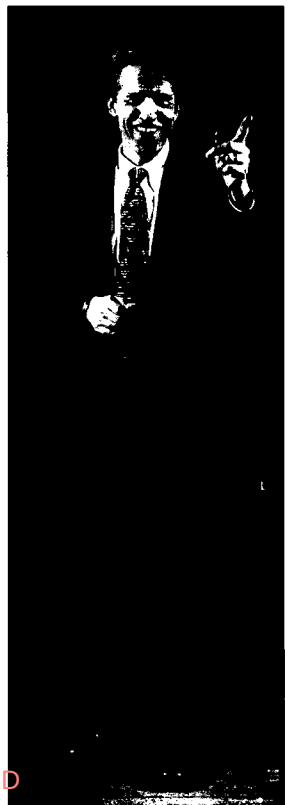
RS: You're talking about an incentive problem – what economists call "moral hazard." I think that practical applied finance has discovered a lot about how to deal with moral hazard. One answer is to limit insurance. There always needs to be some consequences for not trying hard.

PP: Of the proposals in the book, the one that struck me as cleverest is the idea of inequality insurance.

RS: The problem of inequality is alarming and not much discussed.

The stock markets are big and important, but not as big and important as we think. Far more important to the world's economies are wage and salary incomes and other nonfinancial sources of livelihood such as the economic value of housing.

This is where the bulk of our wealth is found.



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Achieving massive risk sharing – that is, spreading risk among many individuals until it is negligible to any one person – does not mean the world will live in harmony.

History shows, however, that long-term arrangements for risk sharing have often been useful despite wars and disruptions of government authority.

Indeed, those events themselves are risks that the financial arrangements addressed.

And it looks like the problem is going to get worse. New technology and globalization are not going away; we could see massive unemployment or massive inequality in coming decades.

The idea of inequality insurance is inspired by other sorts of insurance – but also by research in psychology. Any policy to deal with inequality, which evolved over a long period of time, has to involve enduring changes to our system. I want to restructure tax policy as inequality policy, redefining taxation in terms of income distribution rather than tax rates. Instead of legislating rates and brackets, we would target the acceptable level of inequality and automatically adjust rates to meet the target.

PP: So an individual could still get rich in this system?

RS: The progressivity of the tax system would be adjusted automatically to preserve the desired income distribution, the acceptable degree of inequality. Individuals who worked hard or got lucky could still propel themselves to the top of the heap.

Such a system would be fundamentally different than the current one. Once we collectively defined the acceptable limits of inequality, there wouldn't be much left to fight about in terms of tax policy. Such a system, I think, would have a good chance of enduring for many years. Tax rates would change frequently, but the targeted degree of inequality wouldn't.

As a practical matter, what amounts to insurance would allow us to make sure that inequality did not get any worse than it is today. If markets pushed the economy toward greater inequality, tax policy would push back. But politicians wouldn't have the problem of explaining why tax rates changed.

PP: Sort of like the automatic macroeconomic stabilizers envisioned by the early Keynesians?

RS: That's right. Suppose inequality did get much worse. Even without inequality insurance, the government would probably respond to help reduce its impact. But done after the fact, the response would have the look of charity or welfare. And it would be very limited. That's why it would be so much better to announce before the fact that we, as a society, have decided that we're not going to let inequality get worse.

PP: The other idea in the book that really appealed was to structure public pension systems so that generations share the risk associated with unanticipated changes in demography and income.

RS: Yes, I think this is a matter of common sense. To paraphrase Keynes, some of the best financial arrangements are just very sophisticated versions of simple arrangements that we make in everyday life. What I'm thinking of here is the analogy of the family as a risk-sharing device – extending that to the nation.

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Families traditionally share risk, in the sense that different generations living together more or less pool their income. In a traditional society, the working adults support the children and the elderly. If the number of dependents changes relative to the number of breadwinners, the whole family adjusts its living standard. If grandma and grandpa happen to be rich, they help other members of the family – not the other way around.

That's just common sense, but it's also risk management. By contrast, under the current Social Security system, the pensions of the elderly are fixed, and those still working bear the risk.

PP: So under your proposal, pension benefits would change with dependency ratio – the average number of dependents supported per worker – as well as the average productivity of those still working. In good times, everyone would get an extra piece of the pie. In bad times, scarcity would be shared.

RS: Right.

PP: You also propose that whole economies agree to share risks. In effect, countries would pool risks, with those doing unexpectedly well in terms of economic growth making payments (or concessions of loans) to those doing unexpectedly badly. It would formalize what we do now – providing aid after natural disasters, helping to rebuild economies destroyed in war.

RS: The accident of where you are born matters so much in terms of living standards – much too much. And the idea of aiding the losers after the fact – say, by forgiving the debts of less-developed countries – does not work very well, because it seems like charity.

There's no need to do it that way. Take the case of loans to poor countries hit hard by AIDS, drought, etc. We could make debt forgiveness, where the borrower did unexpectedly badly in terms of economic growth, a part of the loan agreement. And so it would become a risk-sharing agreement.

Individuals could make income-sharing agreements for themselves; it doesn't have to be done by governments. But I think there is a place for governments here, since the impact of changing fortunes for countries lasts so long, and the most useful risk-sharing agreements would be very long-term contracts.

PP: Wouldn't such agreements reduce the pressure on governments to sustain pro-growth economic policies?

RS: That's the "moral hazard" issue again. I think you could deal with this by limiting the portion of income fluctuation that could be insured.

PP: Thanks, Bob. My guess is, you've raised more questions here than you've answered. But that's why folks should buy the book. M

The theory of finance underwent a fundamental transformation starting around 1990 with the development of behavioral finance, the application of principles of psychology and insights from other social sciences to finance.

Behavioral finance corrects a major error in most mathematical finance: the neglect of the human element.

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BY ROBERT HAVEMAN AND BARBARA WOLFE

When we published

an excerpt from Alison Wolf's controversial book, *Does Education Matter?*, in the 4th Quarter 2002 issue of the *Review*, we invited readers to talk back. This comment is a serendipitous result. — *Peter Passell*

Alison Wolf argued that high estimated returns to higher education were based on a statistical misunderstanding – and that society's resources would therefore be far more usefully spent in, say, providing better education at the primary and secondary levels. David Card challenged her interpretation of the evidence, arguing that the most sophisticated statistical studies properly isolated the impact of education on earnings. We think Card was on target, but failed to take the argument far enough.

Wolf's main concern with estimated returns on education stems from the difficulty of accounting for unmeasured factors that affect both earnings and schooling. If certain factors – ability, drive and family background come to mind – are not adequately controlled, the estimates will be overstated. For example, many teenagers work while they are still in school. If this work experience is omitted from consideration in estimating the effects of schooling, the returns from schooling will be exaggerated.

That said, Wolf almost surely overstates the impact of such statistical bias. We are persuaded by the "meta-analysis" of Princeton University's Orley Ashenfelter and his colleagues Colm Harmon and Hessel Oosterbeek, whose study of earlier studies concluded that investments in higher education in the United States yielded 6 to 8 percent market returns for recipients. This compares favorably with returns on most other investments.

But the total gain from education is only partially reflected in estimates of labor market returns because they do not include the nonmarket benefits of schooling. Consider, for example, the benefits to children of having better-educated parents. Moreover, the entire society may gain from what economists refer to as the public-good aspects of schooling – the gains that all citizens experience because they live in a better-educated society. We believe these effects are large, perhaps as large as the market effects of education on which the traditional economic studies focused.

Take the hypothetical example of a young woman at, say, age 16, the earliest age at which children are allowed to leave school in most developed countries. She already possesses some skills. She uses this human capital to

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produce goods and services, in the process consuming resources. The difference between what she produces and consumes represents her net contribution to society, which may be positive or negative. Would it be worthwhile to society to invest in an extra year of schooling for her? The answer turns on whether her net contribution to society increases or decreases as a result.

The tricky part, of course, is how to account for the largely intangible gains that accrue to others on top of the largely tangible

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THE EFFECTS OF ADDITIONAL SCHOOLING

CATEGORY	ECONOMIC NATURE
Individual market productivity	Private; market effects.
Nonwage labor market remuneration	Private; market and nonmarket effects, e.g., fringe benefits and working conditions.
Intrafamily productivity	Private; some external effects; market and nonmarket effects, e.g., relationship between wife's schooling and husband's earnings.
Child quality: level of education and cognitive development	Private; some external effects; market and nonmarket effects, e.g., child education level and cognitive development are positively related to mother's and father's education.
Child quality: health and fertility	Private; some external effects, e.g., child health and reduced chances that daughters will give birth out of wedlock as teenagers are positively related to parents' education.
Own health	Private; modest external effects, e.g., own schooling positively affects one's health status, increases life expectancy, lowers prevalence of severe mental illness (including depression), and improves ability to deal with stressful events.
Consumer, marital and labor market efficiency	Private; some external effects; nonmarket effects, e.g., schooling leads to more efficient consumer activities; reduced costs of job search, increased regional mobility, and improved sorting in marriage market.
Attainment of desired family size	Private; e.g., contraceptive efficiency is positively related to schooling.
Charitable giving	Private and public; nonmarket effects, e.g., schooling increases donations of both time and money.
Savings	Private; some external effects, e.g., more schooling is associated with higher savings rates.
Technological change	Public; e.g., schooling is positively associated with research, development and diffusion of technology.
Social cohesion	Public; e.g., schooling is associated with increased voting, reduced alienation and social inequalities, opposition to government repression, reduced support for use of violence in protests, increased trust of others and membership in community organizations.
Self-reliance or economic independence	Private and public; e.g., more education associated with reduced dependence on transfers during prime working years.
Crime reduction	Public; e.g., schooling is associated with reduced criminal activity and a reduction in recidivism.

gains that flow to the young woman. The table offers a catalog of the possible gains associated with additional education. The first and second categories represent the standard private market returns. They are only a part of the story, however. Indeed, these private labor market benefits may be dwarfed by the private non-market benefits, along with benefits that accrue to third parties or to society as a whole. The third through sixth categories encompass the direct effect on other family members when one member gets more education. There is evidence that the better counsel and assistance in acquiring skills provided by a better-educated spouse increases the earnings of the other spouse. By the same token, the educational level of children is clearly tied to the schooling of their parents.

Children of high school graduates are themselves far more likely to be high school graduates than are children of parents without a high school diploma. And when parents are schooled beyond high school, the effect is even greater. Children's cognitive development and noncognitive skills, in addition to their future earnings, are positively linked to their parents' education.

Nor is the effect confined to the family. Children in communities where adults have a higher level of education are more likely to complete high school, even after other factors are taken into account.

The education of parents, particularly of mothers, is also positively linked to the health of their children. Infant mortality is lower, average birth weights are higher, and preventive measures like vaccinations are more likely to have been taken when parents are better educated. Moreover, the effect reaches to the next generation: the teenage daughters of better-educated parents are less likely to become single parents.

The sixth through eighth categories show some of the effects of increased schooling on one's own well-being – effects that are not fully captured in higher earnings. Because the rewards for labor market performance do not

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reflect these effects, they, too, are excluded (at least in part) from estimates of the returns on schooling emphasized by both Wolf and Card. One private non-market benefit of schooling not even included in the table consists of the consumption value of education – the pleasure experienced in learning.

The sixth category – better health and longer life expectancy – may be due to a greater range of work choices (which makes it easier to avoid hazardous occupations), or to the economic wherewithal to live in safer, less-polluted neighborhoods. Certainly, better-educated people tend to be better informed about health and nutrition, are less likely to run health risks and have better information on where to secure good medical care. Those with more schooling are less likely to smoke, or, if they do smoke, are likely to smoke less: on average an additional year of schooling reduces daily cigarette consumption by 1.6 for men and 1.1 for women. More-educated individuals are also less likely to be heavy drinkers, and are more likely to exercise.

Economists have been reluctant to claim this causal link, arguing that better health and longer life expectancy may reflect a third factor that causes both longer school attendance and better health. But the absence of any obvious candidate for the third factor and the strength of the statistical relationships between schooling and these health-related behaviors strongly suggest that education is, in fact, the cause. Some of these health benefits may be captured in higher earnings – people who are sick less earn more – but the nonmarket private gains from this relationship are clear. If nothing else, good health reduces pain and suffering, as well as anxiety in response to stressful life events, and reduces expenditures for medical care. Consider, too, that improved health has many external benefits, inhibiting the spread of contagious disease and increasing the happiness of relatives and friends.

More schooling is also associated with greater savvy in market transactions – what economists call consumer efficiency. In

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straightforward market decisions regarding, say, personal loans or the purchase of eyeglasses, more schooling is associated with better choices – probably because more-educated individuals tend to be more efficient at acquiring information. Success in the labor and marriage markets appears to be related to schooling, perhaps in part because schooling improves matchmaking ability in both areas and reduces the time spent searching. Better-educated people also tend to be more successful in planning family size. Again, it is likely that those with more schooling are better able to gather the information necessary to avoid unwanted births or to achieve desired ones.

Beyond effects within the family are the gains from one's own schooling that accrue to others in society – the external effects and public-goods effects that are never reflected in rates-of-return calculations, and rarely even noted. Other things being equal, better-educated people on average give more to charity. One study found that college graduates volunteered nearly twice as many hours and donated 50 percent more of their income than high school graduates did. People with more education are more likely to save, and to save more (category 10). This is only a benefit if capital markets are imperfect and private savings are less than optimal – but there is a near-consensus among economists that this is, indeed, the case.

Those with more education more readily adjust to the technological and social changes driving contemporary society. They are also more likely to make informed choices when voting, and to participate in organizations that make communities more cohesive. Then, too, there is evidence that the better educated are more likely to protest against what they see as government repression, and to do so in a non-violent manner. To be sure, it is hard to untangle the web of cause and effect here; the poor and less educated protest more – but they have more to protest.

Finally, there are the societal effects of increased schooling. Higher education among community members is linked to lower levels of social dependence and lower rates of criminal activity, especially violent crime. People

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with more schooling are less likely to be recipients of welfare or disability-related benefits. One needs to be careful not to double-count benefits here, however; the reduced social dependence may be a side benefit of the capacity of people with more schooling to better maintain their health, or to earn more.

Daughters of better-educated mothers are less likely to be on welfare, even if they are eligible for benefits. Criminal activity in a community tends to decrease as average educational attainments increase – but again the evidence must be interpreted carefully.

The relationships listed in categories 3 to 14 represent the effects of schooling that are not captured in traditional estimates of the private economic returns on education. Research has determined the direction, and in some cases the magnitude, of all the relationships we have postulated; we have documented these findings elsewhere. Among the most robust and substantial relationships are the effects of schooling on one's own health and the effects of parents' schooling on their children's health, education and childbearing.

In our view, all this adds up to a convincing response to Wolf's claim that current levels of public expenditure on education are excessive. To be sure, the education sector in developed countries is very large, and makes substantial financial demands on governments and private citizens. Members of the Organization for Economic Cooperation and Development spend an average of about 5.1 percent of GDP on schooling services, with about one-quarter of the total going to higher education. Public sector costs, however, constitute only about 30 percent of the full social cost of education. When privately borne financial costs and forgone earnings of those in school are accounted for, the total invested in higher education across these countries is about three times the public sector cost – or about 3 percent of GDP.

Wolf's claim of excessive higher education spending is plausible, of course, because education is largely removed from the market test; the public sector plays a large role in financing schooling services. As a result, the private benefits of education cannot be

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inferred from conventional market analysis. In Wolf's view, political leaders have used bloated estimates of the returns on schooling to boost spending on higher education beyond efficient levels. However, we argue that the non-market, external, and public-goods effects should also be recognized, and they, too, should be measured.

We have roughly calculated the marginal value for the private non-market components of the effects of education, using estimates from the research literature and from basic relationships observed in a market economy. The numbers are large.

For example, we estimate that parents place a value of at least $500 on the cognitive advantages that accrue to their children if they themselves have an additional year of schooling. Improvements in the efficiency of consumer choices generate an average of at least $300 per year in benefits, while the lifetime value of the improvement in one's own health equals several thousand dollars. Public goods are less amenable to such quantification. But incremental schooling in a community has been credited with an annual gain of about $170 per capita in reduced policing expenditures.

It is not unreasonable to suggest that the gains from all the categories of private non-marketed and external or public goods identified in the table beyond the first two categories would be at least equal to the earnings effect of more schooling estimated in the traditional studies – that is, $2,000 to $4,000 per year. If so, the full social rate of return to an additional year of schooling would be on the order of 14 to 18 percent, or double the return to education discussed by Wolf and Card.

With these estimates in hand, we return to Wolf's questions of public policy. How much should we spend on schooling? Who should pay the bill? Since few other public or private investments can claim social returns greater than those we attribute to incremental investments in higher education, arguments for cutting higher education funding seem unwarranted. Given a full accounting of social benefits and costs, there is no reason to believe that the net contribution of additional years of schooling is negative – that the additional social output contributed by incremental investments in higher education is less than the social cost of providing these schooling services.

There is no reason to believe that the net contribution of additional years of schooling is negative.

Our results say little about how the private and public sectors should share these costs. While we argue that more weight should be placed on the non-market, external, and public-good effects of education relative to the market benefits, this does not determine who should pay.

However, our calculations do suggest that the private gains from education – market and non-market – are larger than the traditional estimates suggest. If so, there is a stronger argument for increasing tuition and fees on students and their parents, especially for higher education. Of course, such an increase in the price of schooling would require more financial aid for students who lack the resources to pay for this socially efficient level of educational services.

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BY MICHAEL D. INTRILIGATOR

The term "globalization" was coined in the 1980s, but the concept is an old one that has meant different things to different people. Some see it as a force for advancing the world economy, while others see it as a serious threat to global economic health and stability.

I believe there are both positive and negative aspects to globalization. Some of its positive features stem from the competition it stimulates, while some of the negatives could be offset through the development of new international institutions. Thus, while globalization can cause conflict, it can also contain conflict by realizing the potential for global cooperation.

GLOBALIZATION: AN INTERPRETATION

Globalization, from my perspective, means major increases in trade and exchange in an increasingly integrated international economy. There has been remarkable growth in international transactions – not only in traditional trade, but in the transfer of capital, labor, technology and ideas. One measure of the extent of globalization is the volume of international financial exchange: some $1.2 trillion flows through New York currency markets each day.

A variety of factors have primed this pump in recent decades. One has been technological innovation, which has significantly lowered the costs of transportation and communication, while driving down the costs of data processing and storage.

A second source of globalization has been trade liberalization and other forms of economic liberalization. These processes started in the 19th century, but the two world wars and the Great Depression interrupted them. The processes resumed after World War II, embodied in the 1946 General Agreement on Tariffs and Trade, which has since evolved into the World Trade Organization. Barriers to trade in goods and services are down sharply, while movements of capital, labor and technology face fewer obstacles.

Some have suggested that globalization is little more than a return to the economic framework of the late 19th century. At that time, borders were relatively open and there were substantial international flows of capital and people. Moreover, Europe depended critically on international trade as part of its colonial system.

Yet, that earlier era lacked much of the technology that has made globalization such a potent force for change today.

A third source of globalization has been changes in institutions. Organizations – public and private – have a wider reach, due in large part to advances in transportation and

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communications. Thus, corporations that once focused on regional markets now produce in many countries and sell to the whole world. Indeed, almost a third of international trade now occurs *within* multinational enterprises. Accordingly, international conflict has, in part, become conflict between multinational businesses. These global firms are seen by some as a threat to the scope and autonomy of the state. But the nation-state still runs the show.

A fourth factor driving globalization is ideological convergence – specifically, a consensus on the value of free markets. This process began with the post-Mao reforms in China followed by the collapse of the Soviet system and empire. The division between market economies in the West and command economies in the East has been replaced by a near-universal reliance on markets.

It is worth emphasizing that this transition, built on a foundation of stabilization of the macro-economy, liberalization of prices and privatization of state-owned enterprise, has not been easy. Indeed, this "SLP" agenda neglects the role of reform in building the institutions to defend free markets and to provide a safety net for the losers.

A fifth force pushing globalization has been culture – and, in particular, the rise of a homogenized English-based popular culture propagated by television, movies and the Internet.

The French and some other continental Europeans see globalization as an attempt to assert America's cultural hegemony. In effect, they see globalization as a new form of imperialism. Some have even interpreted globalization as a new form of colonialism, with the U.S. as the new metropole power and the rest of the world as its colonies.

Wherever one stands on the merits of globalization, it should be understood that the process creates both opportunities and challenges. It is also clear that the process is moving rapidly. Thus, barring radical changes, the trend toward greater global integration will continue, perhaps at an accelerating pace. For example, integration of commerce in services, notably telecommunications and financial services, has only just begun.

IMPACT OF GLOBALIZATION ON NATIONAL ECONOMIES

Globalization has had a significant impact on all economies. It affects production, as well as the employment of labor and other inputs in production. It affects investment, both in physical and human capital. It affects the direction and pace of technology. And in the process, it has major effects on efficiency, productivity and competitiveness.

Several consequences deserve particular mention. One is the pace of foreign direct investment (FDI), which is growing more rapidly than trade. FDI plays a key role in technology transfer, in industrial restructuring and in the formation of global enterprises – all of which are transforming national economies.

A second impact is on innovation. New technologies, as already noted, have driven globalization. But there is a positive feedback effect: globalization and the consequent spur to competition have also stimulated further advances in technology.

A third consequence is the growth of trade in services, including financial, legal, managerial and information, "intangibles" of all types that have become mainstays of international commerce. In 1970, less than a third of FDI involved the export of services. Today that fraction has risen to half; indeed, intellectual capital is the single most important commodity on world markets.

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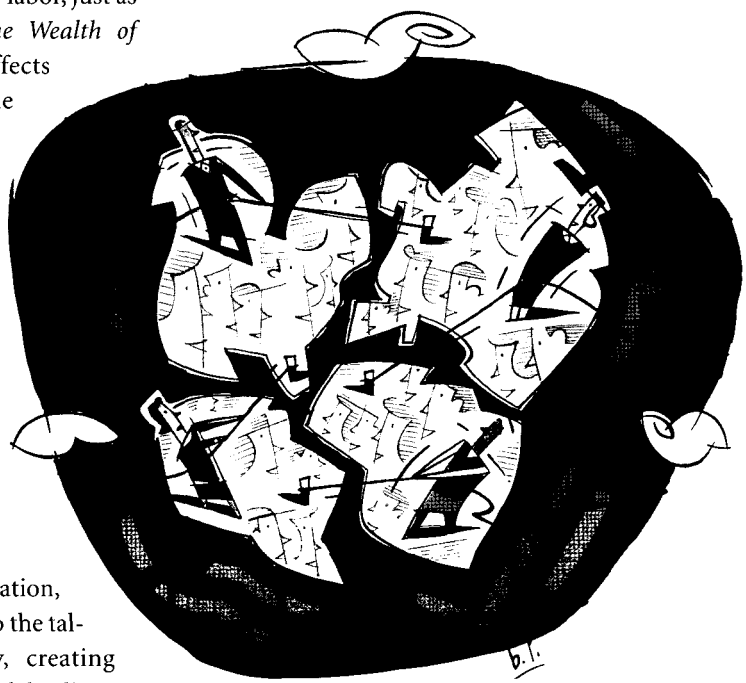
THE BENEFITS OF GLOBALIZATION STEMMING FROM COMPETITION

Globalization allows – in fact, forces – firms to compete across borders. While some fear competition, it is critical to increasing productivity. The widening of markets allows specialization and the division of labor, just as Adam Smith suggested in *The Wealth of Nations*. Other beneficial effects include the economies of scale and scope in production, which can reduce costs. Perhaps most important, globalization forces innovation. Would Detroit, for example, be producing reliable, energy-efficient cars today without the spur of competition from Japan and Germany?

THE COSTS OF GLOBALIZATION AND POTENTIAL CONFLICTS

There is a dark side to globalization, too. Much of the gain has gone to the talented, industrious and lucky, creating greater economic inequality and leading to conflict, domestic and international. Some like to believe that all will end well, as rapid growth in poor economies narrows the gap with the rich countries. The reality, however, is that the least developed nations have been left in the dust. Globalization has not led to convergence, but to the polarization of incomes, with an unlucky rump losing ground in both absolute and relative terms. Indeed, income distribution is a major challenge in the process of globalization.

A second problem is the potential for regional or global instability stemming from economic interdependence. In a world of open markets, a crisis in one nation can easily spread. Thus in 1997, a currency collapse in Thailand toppled the (admittedly vulnerable) economies of Malaysia, Indonesia and Korea, and played a role in the fall of the Russian ruble. A worldwide recession or depression could lead to efforts to isolate national economies – a process that in the Great Depression led to the collapse of international trade and sowed the seeds for World War II.



BRYAN PETERSON

A third source of anxiety is the loss of sovereign control associated with the globalization of markets. In a world where critical technology comes from somewhere else and trade protection is limited by treaty, national leaders quite rightly feel they are in the grip of economic forces they cannot control.

It is sometimes alleged that globalization causes unemployment in the high-wage industrialized economies that can't compete against third world workers who labor for "a bowl of rice a day." The low unemployment rates in many high-wage nations and the high rates in many low-wage nations, however,

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suggest this simply isn't true. National policy and technological trends are much more important determinants of employment.

Consider, however, that the economic costs are but one component on the liability side on the globalization balance sheet. There are potential noneconomic costs – notably, in security, where open borders and rapid diffusion of technology make us all vulnerable to terrorism. By the same token, globalization leaves us more vulnerable to pandemics and to environmental pollutants.

THE ROLE OF GLOBAL COOPERATION IN DEALING WITH THREATS

How will the costs of globalization stack up to the benefits? The answer depends on the competence of the institutions created to guide it. Thus, globalization represents both a challenge and an opportunity. The challenge is to create a new world system that mitigates the costs. And success turns on the ability to convince the critical players that their own interests lie in cooperation.

Consider how global cooperation might cope with the problems identified earlier. A supranational institution could address the problem of income distribution by taxing the nations gaining from globalization and using the proceeds to provide financial and technical assistance to the losers. This is already being done in a somewhat haphazard way through the World Bank – in particular via its soft lending arm, the International Development Association, which provides loans to poor nations at below-market terms. The loans should be made, however, on a more systematic basis – and that would require either a new international institution or a revamping of the World Bank's charter.

By the same token, institutions must be devised to cope with the international economic system's vulnerability to financial shocks. The IMF has played a key role in supporting economically unstable nations in times of trouble – think Mexico during the peso crisis or South Korea during the East Asian financial crisis. More credible insurance against such risks would require a substantial augmentation of the resources of the IMF – its assets have not grown apace with the volume of international transactions. This might be financed with a "Tobin tax," a very small tax on all foreign exchange transactions that would serve to reduce the chance of destabilizing currency speculation.

The third problem stemming from globalization is the loss of sovereignty. Once again, however, international cooperation can play a role in minimizing conflict – here, by drawing a firm line between the province of sovereign governments, and the province of international organizations and global enterprise. For example, the regulatory regimes of nations and even international organizations have become more porous and more easily overcome through technology advances. Examples include the lack of capital market regulation, of trade in information services, and of labor and environmental safeguards.

Overall, there are several possible vehicles for responding to the challenges of globalization. One is strengthening existing international institutions. Another is the establishment of new institutions that have binding dispute-settlement mechanisms. A third is the establishment of larger entities, such as the European Union, or loose combinations of nations to cope with specific economic issues, such as the G-8 or the Asian Pacific Economic Cooperation. Through such cooperation it should be possible to ensure equity and stability in a globalized world – while speeding the transition of the former socialist states and jumpstarting growth in poor nations. M

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BIG IDEAS

The sixth annual Milken Institute Global Conference, held in Los Angeles, March 31-April 10, attracted an audience of 1,600 to sample the ideas of 180 panelists ranging from major corporate CEOs, to Nobel laureates in medicine and economics, to a senior official from the CIA.

Among the highlights:

- A heated debate on "America's Role in the World" with Bob Bartley, William Bennett, Gary Hart and Stephan Richter.
- A discussion of "The Long View" of history with Paul Ehrlich, Robert Fogel, Steven Pinker and Alvin Toffler.
- A Nobel economist roundtable with Kenneth Arrow, Gary Becker and Myron Scholes, moderated by Michael Milken.

To view summaries of the conference sessions or listen to recordings of the sessions, visit www.milkeninstitute.org/gc2003.

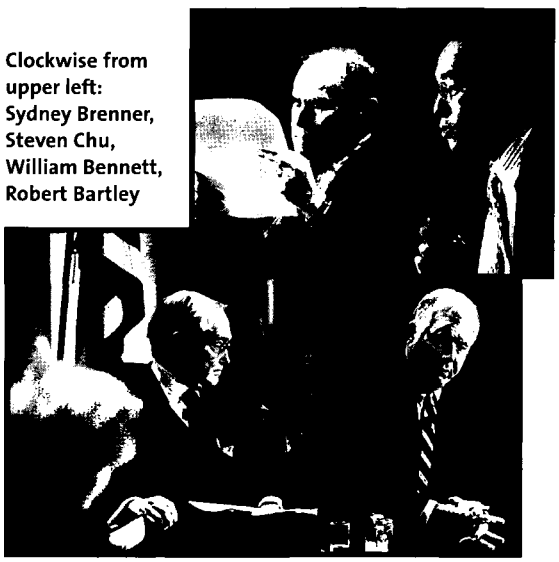
AWARD WINNERS

Six scholars have been named winners of the 2003 Milken Institute Award for Distinguished Economic Research. The group includes Darius Lakdawalla (RAND), Tomas Philipson (Chicago), Frank Lichtenberg (Columbia), Hillel Rapoport (Stanford), Michel Beine (University Libre de Bruxelles), and Frederic Docquier (Belgian government).

2003 CAPITAL ACCESS INDEX

Hong Kong, the United Kingdom and the United States remain at the top of the Milken Institute's Capital Access Index, an annual ranking of the openness and efficiency of capital markets worldwide. The runners-up: Singapore, Netherlands, Switzerland, Canada, Luxemburg and New Zealand.

The complete listings, along with an explanation of the methodology and an analysis of trends in capital access, are available at www.milkeninstitute.org.



Clockwise from upper left: Sydney Brenner, Steven Chu, William Bennett, Robert Bartley

ECONOMICS, HEALTH CARE AND NEW ENGLAND

According to Institute researchers Ross DeVol, Rob Koepp, Perry Wong and Armen Bedroussian, health care directly comprises 7.5 percent of New England's gross regional product. More important, they suggest, the spillovers from health care make it a key driver of growth in the New England economy. Their report, *The Economic Contributions of Health Care to New England*, is available at www.milkeninstitute.org. M

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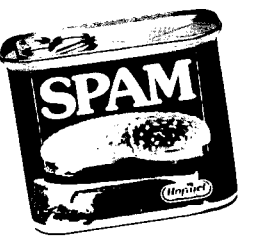
THE UTILITY MAXIMIZING CHEF



The price of Italian pancetta is at a four-year high, pushing many traditional dishes out of reach. But as Nobel Prize-winning economist Paul Samuelson once noted, that's why The Almighty invented the elasticity of substitution. Consider this artery-clogging alternative recipe.

SPAGHETTI CARBONARA

1½	lbs. spaghetti	4	eggs, slightly beaten
1	12-oz. can SPAM, cubed ¼"	½	cup grated parmesan cheese
½	cup chopped onion	¼	cup chopped fresh parsley
3	tbsp olive oil		ground pepper
3	tbsp butter		

Cook spaghetti according to package directions. Meanwhile, brown SPAM and onion in oil and butter over medium heat. Set aside. When spaghetti is cooked, drain; return to pot. Add eggs; toss to combine. Add SPAM mixture, cheese and parsley. Season with pepper. Serve immediately. Yield: 6 servings.

GRAZ, AUSTRIA. Researchers at the Schonbrunner Institut für Veltwerkgemeinshaft have shown that brushing teeth doesn't pay for men, ages 23-64. Like all activities, brushing has an opportunity cost. And this activity is not rational unless the risk-adjusted, discounted value of the benefits (avoidance of root canal, gum surgery and purchase of denture adhesive) exceeds this cost in time and materials.

At a real discount rate of 4 percent and an estimated age of 46 for first periodontal intervention, costs exceed benefits by 37 percent. This result is quite robust over a broad range of parameter values. However, the Institute does acknowledge that men earning less than $6.42 an hour may find it is cost-effective to brush on weekends.

The Institute is now at work on parallel studies regarding dry cleaning. But publication may be delayed: the primary investigators have concluded their time is better spent elsewhere.

Green SUVs

With your average Hummer managing just 10.5 miles to the gallon, the pressure is on to regulate sport utility vehicles. But as economists know, government intervention can be costly and often leads to unintended consequences. Hence, at the request of both senators from Michigan, the Congressional Office of Technology Assessment has produced a plan for voluntary internalization of the social costs of SUV use.

The Department of Energy would be directed to estimate these costs, based on current projections of the damage from global warming, as well as from asthma and heart disease-related morbidity. SUV owners could then use the estimates to make appropriate donations to Friends of the Earth and the March of Dimes. Tax breaks, available to those earning more than $2.1 million annually would offset 70 percent of the net.

ABOVE: COURTESY HORMEL FOODS; BELOW: ©HULTON-DEUTSCH COLLECTION/CORBIS

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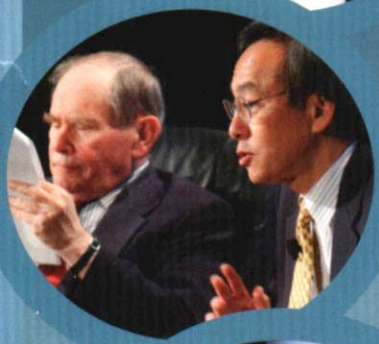

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